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APPENDIX

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OF THE

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DOMINION OF CANADA

SESSION 1903

OTTAWA
PRINTED BY S. E. DAWSON, PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1904

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APPENDIX

LIST OF APPENDICES, 1903.

No. 1.—Second Report of Select Committee appointed in reference to Bill No. 20, an Act to amend the Weights and Measures Act. *Not printed.*

No. 2.—Sixth Report of the Select Standing Committee on Agriculture and Colonization. *Printed herein.*

No. 3.—Second Report of the Select Standing Committee on Privileges and Elections in reference to allegations against George M. Loy, Esquire, Member for the Electoral district of Beauharnois. *Not printed.*

No. 4.—Second Report of the Select Standing Committee on Public Accounts, relating to expenditure incurred in connection with the last Census. *Not printed.*

REPORT

OF THE

SELECT STANDING COMMITTEE

ON

AGRICULTURE AND COLONIZATION

THIRD SESSION, NINTH PARLIAMENT

1903

PRINTED BY ORDER OF PARLIAMENT

OTTAWA
PRINTED BY S. E. DAWSON, PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1904

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THE COMMITTEE.

(JAMES M. DOUGLAS, Esq., *Chairman.*)

Messieurs :

Angers,
Ball,
Bazinet,
Beith,
Bell,
Bernier,
Blain,
Bourassa,
Bourbonnais,
Boyd,
Broder,
Brown,
Bureau,
Calvert,
Calvin,
Carbonneau,
Cargill,
Carscallen,
Charlton,
Clancy,
Clare,
Cochrane,
Davis,
Delisle,
Desjardins,
Douglas,
Dugas,
Dyment,
Erb,
Ethier,
Farquharson,
Fisher,
Fortier,
Galliher,
Gauvreau,
Gilmour,
Girard,
Gould,
Grant,
Guthrie,
Hackett,
Halliday,
Harwood,
Henderson,
Heyd,
Hughes *(King's)*,
Hughes *(Victoria)*,
Ingram,
Johnston *(Cardwell)*,
Johnston *(Lambton)*,
Kendall,
Kidd,
Lang,
LaRivière,
Laurier *(L'Assomption)*,
LeBlanc,
Lennox,
Léonard,
Lewis,
Logan,
Lovell,
Loy,
Macdonald,
Mackie,
MacLaren *(Perth)*,
Macpherson,
McColl,
McCool,
McCormick,
McCreary,
McEwen,
McGowan,
McGugan,
McIntosh,
McLennan,
Marcil *(Bagot)*,
Martineau,
Matheson,
Mayrand,
Meigs,
Morin,
Mulock (Sir *William*),
Oliver,
Parmelee,
Pope,
Proulx,
Reid *(Grenville)*,
Reid *(Restigouche)*,
Richardson,
Robinson *(Elgin)*,
Robinson *(Northumberland)*,
Roche *(Marquette)*,
Rosamond,
Ross *(Ontario)*,
Ross *(Victoria)*,
Rousseau,
Schell,
Seagram,
Sherritt,
Simmons,
Smith *(Vancouver)*,
Smith *(Wentworth)*,
Sproule,
Stephens,
Stewart,
Talbot,
Taylor,
Thomson *(N. Grey)*,
Tobin,
Tolmie,
Tolton,
Tucker,
Turcot,
Turgeon,
Vrooman,
Wade,
Wallace,
Wilmot,
Wilson and
Wright.

REPORT.

The Select Standing Committee on Agriculture and Colonization present their Eighth and Final Report, as follows:—

The Committee have had under review during the current Session of Parliament the subjects of Agriculture and Colonization, as forming two general divisions of inquiry, upon the various details of which they have taken evidence, and which they submit to be annexed hereto, as an essential portion of this Report.

The inquiry into Agriculture presented two aspects, viz.: the agricultural productions of the several Provinces and Territories of the Dominion, both as to actual production and the commercial value of these products for home consumption and for export, as well as the capability of the several geographical divisions for future expansion of production and commercial value. The Committee find, upon the evidence heard, that in both these directions the agricultural industry of Canada is in a very prosperous condition, not merely as a result of an accidental boom from either a local or foreign source, but has been steadily expanding year by year for many years past, but especially in recent years has this expansion of production and export increased at a most gratifying pace.

As production and export are correlative, the increase in the value of the latter for a succession of years may be taken to indicate approximately the increase in the former.

The following value of exports, from official reports, may be adopted as an index to the quantitive production of the country:—

EXPORTS.

The export value of cheese and butter in 1892 was	$12,700,000
In 1902 it was.	25,300,000

That is about double in ten years.

The export of pork and bacon in 1890 was	$ 600,000
" " " 1896 "	4,500,000
" " " 1902 "	12,500,000

This shows an increase of seven and a half times in the first six-year period, an increase of nearly three times in the last six-year period, and an increase from 1890 to 1902 of $11,900,000; making the export value of 1902 about equal to that of 1890, multiplied by 21, as the increase of the twelve-year period, in pork and bacon.

The export values of all farm or food products from

Canada were in 1890.	$24,000,000
And in 1902 they were.	80,000,000

This shows a total increase of all farm products in the twelve-year period of $56,000,000, or making the export value of 1902 equal to that of 1890 multiplied by 3½.

In estimating by the index of exports, whether given by value or quantity, the total production of cereal foods, it should be borne in mind that, in Canada, there remains every year a large surplus beyond that exported and required for human food in home consumption.

This surplus is necessarily consumed in the fattening of domestic animals, and, therefore, chargeable to live stock account.

The causes contributory to the rapidly increasing farm products in quantities and export values may be cited as follows:—

(*a.*) Favourable conditions of soil and climate utilized by the intelligence, indomitable energy and enterprise of the Canadian people.

(*b.*) The early foundation of high-class farming by leading agriculturists in the old Provinces, stimulated and expanded in more recent years by the action of the several Governments in providing scientific education in agriculture and extending this aid by the provision of cold storage at cheese and butter factories, upon railway cars and steamships for the preservation of readily perishable products to an extent that now enables these products of Canada to be placed upon the markets of Great Britain in prime condition.

(*c.*) Through the intellectual receptivity of the Canadian agriculturists in appropriating to their profession the discoveries of scientific investigations, and their enterprise in utilizing farm machinery as a means of rapidly extending and widening the areas of cultivation.

(*d.*) By substantial assistance extended by Government to communities in the establishment of co-operative dairying and marketing, by temporary loans of money, sending abroad dairy experts as teachers, providing exhibitions of the proper packing of fruits, spreading abroad information on the requirements of trans-Atlantic markets, and by similar aids extended to poultry raising for distant markets.

(*e.*) The expansion of farm products for export is stimulated also by the increase of purchasing ability of the people of the countries to which the exports are made. For example, the consumption of eggs by the United Kingdom, in 1881, was 22 per capita of the population, and in 1901, the consumption reached 49 eggs per head. And this principle of increased means of purchase has contributed to the increased purchase of prime Canadian products.

The possible extension of Canadian agricultural expansion and the volume of export to which it may attain by the end of the current decade is impossible to estimate. Every year witnesses the bringing under cultivation of vast areas of fertile lands which to-day form pioneer settlements and are the next year centres of new extensions. Besides, each succeeding year reveals new and fertile territory hitherto unknown or unthought of, and to what limits these agricultural territories extend are yet far from being determined. Canada has correctly received recognition as the Granary of the Empire, but indisputable evidence presents as a fact the capability of Canada to supply food to purchasing millions on the Continent of Europe and in the Orient.

APPENDIX No. 2

An examination into the vast agricultural resources of the Dominion and her other, as yet, almost latent powers as auxiliaries in the production of all that is necessary to the comfort and sustenance of man in time of peace, and for defence in the exigencies of war, leads to the irresistible conclusion that she ranks as one of the most self-contained countries of the world.

The Committee are of opinion that these estimates as to the present and future of Canada are fully sustained by the evidence taken by them and hereto annexed.

BINDER TWINE.

The material of binder twine supplied to the farmers of Canada was also a point of inquiry by the Committee. The evidence upon this was furnished by Mr. Joseph Haycock, Dominion Inspector of Binder Twine. The Inspector furnished the information collected by him and the details of his official acts are for the fiscal year ended June 30, 1902.

The importance of providing inspection for the purpose of protecting farmers against fraud in the quality and quantity of the twine they purchase is indicated by the consumption of it in 1902, valued at $3,500,000. The Inspector stated in his evidence that in fourteen cases he imposed fines, amounting in all to $518, for shortage of the quantity indicated by the labels attached. Besides, 275,000 pounds were deported to manufacturers in the United States, and a quantity was confiscated to the Crown. These violations of the Binder Twine Act of 1902 were almost solely found with the imported article.

The consumption of binder twine in Canada in 1902 is estimated at 14,000 tons, of which 6,500 were of home manufacture, leaving over 50 per cent supplied by importation. Here again is furnished demonstration of a large expansion open for the output of the twine factories in Canada.

IMMIGRATION.

The Committee's inquiry into the progress of immigration demonstrates that there is a rising tide setting in from the United Kingdom to Canada, and that this country is at present attracting a wide-spread attention throughout a number of foreign countries, in both the Eastern and Western Hemispheres, as being a most desirable country, in which agriculturists possessed of thrift, sobriety and industry, can speedily make for themselves comfortable homes, for evermore free from the fear of poverty, in one of the healthiest climates on the face of the globe, of which the people of Canada, with their herds and flocks, are living examples—a country in which the property and civil rights of every individual alike are carefully guarded by the power of the law.

The details of the executive work of the immigration operations for the year 1902 are very fully set forth in the evidence submitted to the Committee by Mr. James A. Smart, Deputy Minister of the Interior, together with other evidence hereto annexed, namely : the evidence of Mr. A. F. Holmes, a former Immigration Agent, and that of Mr. J. G. Turriff, Dominion Lands Commissioner.

The latter stated in evidence that in the course of his explorations of the North-west Territories of Canada, he found almost everywhere, along the eastern side of the Rocky Mountains, abundance of coal well adapted to domestic consumption. This condition of abundance of fuel within easy reach is an additional factor in considering the desirability of the Territories in their fitness for settlement.

The Committee recommend that 40,000 copies of the evidence of Mr. Joseph Haycock, Dominion Inspector of Binder Twine, annexed hereto, be printed forthwith in pamphlet form, in the usual numerical proportions of English and French, as advance sheets of the Committee's Final Report, for distribution to Members of Parliament, less 100 copies for the use of the Committee.

All of which is respectfully submitted.

JAMES M. DOUGLAS,

Chairman.

House of Commons,
October 9, 1903.

THE EVIDENCE

PART I

AGRICULTURE IN CANADA

CANADIAN FRUIT EXPORT

HOUSE OF COMMONS,
COMMITTEE ROOM, No. 34,
FRIDAY, May 8, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock a.m., Dr. DOUGLAS, Chairman, presiding.

Mr. W. A. MACKINNON, Chief of Fruit Division, Department of Agriculture, was present by the request of the Committee, and made the following statement:—

Mr. CHAIRMAN AND GENTLEMEN,—By direction of the Minister of Agriculture, and under the immediate instructions of Professor Robertson, I spent last season visiting the fruit markets of Great Britain with a view to ascertaining in what ways the Canadian fruit shipped to those markets might be improved.

THE QUESTION OF BEST VARIETIES FOR THE BRITISH MARKETS.

The chief objects of the inquiry were to ascertain the best varieties of fruit for export and the proper packages in which to ship those varieties. I shall deal first with the question of varieties and inform the committee of what I was able to learn from the trade in Great Britain. I will only premise that I visited all branches of the trade, from the large broker who first receives our fruit, to the owners of the smallest retail shops, in order to get as far as possible an unbiassed view of the situation.

The varieties of apples which appear to be chiefly in demand were first the Baldwin, which was everywhere wanted ; then the Spy, always highly prized if it arrives in good condition, if it is uniform, the variations in condition and size being among its chief defects. The Spy is especially saleable in and about Manchester. The Greening is always asked for in all parts of Great Britain ; the Russet is nearly always included among the desirable varieties and is especially popular in the Midlands, in Birmingham, Leicester, and other towns. The 'King' is wanted for the fancy trade, being a very large apple, and when it is at its best it sells better at so much a dozen, whereas the usual trade in apples is by the pound. You will readily perceive that smaller apples are better adapted to sale by the pound, as the dealer must always give the exact pound as asked for. The Ribiston Pippin, commonly called Ribston, is especially favoured in London—when I say in London, I mean the south of England, London being the centre of that trade. Blenheim, or Blenheim Orange, is also desired in London. The Ontario and Stark are very well thought of where they are known, but I found they are not generally known as yet, the quantity shipped having been small. The Mann is also a favourite apple so far as it has become known. The Ben Davis, about which there is a great deal of discussion at the present time, is not always asked for ; the best dealers say they will not have it at any price, but the trade generally appreciate it as an apple which keeps long and looks well, and nearly always arrives in good condition. It is, as they put it, a good window apple, a good display apple, and I have seen many times a sort of pyramid built up in the fruit seller's window, faced with Ben Davis apples right to the peak ; and they made a great showing, but the fruit behind was some other less highly coloured apples.

By Mr. Wilson :

Q. What do the principal dealers give as the cause of their objection ?
A. Simply a matter of quality and flavour.
Q. Flavour of what ?
A. It is a dry and rather tasteless apple.

Mr. WRIGHT.—We substitute it for turnips a good deal.

By Mr. Ross (Victoria) :

Q. What about the Gravenstein ?
A. The Gravenstein was not mentioned by the trade. I think it goes almost exclusively to the London market from Nova Scotia ; it is an early apple, and is thought very well of by those who deal in it. Perhaps I should explain here that I am not giving my own opinion as to apples which are good for the export trade. I am giving the demands of the British market, the apples which they of their own volition asked for, and I might also mention the Colvert, which is a good apple for export in the autumn, and which does very well, especially in Glasgow and the markets about there, but that also was omitted by members of the trade of whom I inquired.
Q. Do you think enough MacIntosh Reds have been going to the market to compare them with the other varieties ?
A. Hardly enough perhaps, but the MacIntosh Red is highly esteemed when it is in good condition ; and I might add the Wealthy and Snow or Fameuse.
Q. The MacIntosh Red is a good keper and comes in somewhere along with the Baldwin.
A. Earlier and is of very fine flavour.

By Mr. Robinson (Elgin) :

Q. You say the Baldwin takes first rank ?
A. It was universally mentioned but that does not mean that it is the best.
Q. It does not bring the best price ?
A. Not always, but for trade purpose it is always asked for in all parts of the country. It may be of interest here to mention that the Baldwin is the apple which the trade on this side, universally speak of as one of the first four paying varieties. The Spy, Greening and Russet are nearly always mentioned too.

By Mr. McEwan :

Q. Where is the King ?
A. It is a fancy apple and the fancy trade is best developed in London ; there is a market there for a high priced article.

By Mr. Ross (Ontario):

Q. The objection is its size ?
A. It is too big for general custom.

By Mr. Wright :

Q. Too big for general custom?
A. I should not like to give the idea that there is an objection to the King apple, but it is particularly suitable to the fancy trade.

By. Mr. Robinson :

Q. It is a little shy bearer.
A. Then taking the pears, the Bartlett is a very popular pear.

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Mr. Ross (Ontario):

Q. You speak of apples being sold by weight; are they always able to manage to strike the amount required? Suppose a man wants a half a pound of apples?

A. I do not know that they would sell a half a pound, but if he asks for a pound, he is entitled to get it.

Q. A pound?

A. A pound or more.

Q. What is the price per pound?

A. Two pence or three pence.

Q. That is the average price ?

A. That is the average price.

Q. If not an even pound, say there was half a pound over, does the buyer have to take it and pay for it?

A. No, the onus is on the salesman to supply a pound, and he has to get as near it as he can.

Q. Does he split an apple to make up the pound ?

A. No.

Q. He has to pick out smaller ones to make the weight ?

A. I am told they become very expert at getting just a pound.

By Mr. Hughes (Victoria) :

Q. How do these apples stand packing, the King variety ?

A. The King ships very well, but not the best. It is an apple which I intend to speak of later as well adapted to shipping in boxes.

By Mr. Ross (Ontario) :

Q. From your experience of the selling of apples by weight in England, is it reasonable to say the trade likes it, that it is satisfactory to the trade all round, that it is as satisfactory as selling by measure ?

A. More than that, I do not think they will consent to change.

Mr. WRIGHT.—That is the way we sell them ; it is the ideal way to sell apples, and it ought to be the way to sell eggs, too.

By Mr. Stephens :

Q. Is it your experience that the package is far better than the box for apples ?

A. That depends on conditions ; I come to packages in the second part of my subject.

Then, as to pears, the Bartlett is wanted on the same conditions as the Spy, namely, if it arrives in good fashion. Then comes the Duchess if well grown. It is a saying with regard to the Duchess that if it weighs less than four ounces it is worthless. That is going too far, but it indicates that the Duchess pear must be of good size to satisfy the market demands. At least one shipper on this side last year made the mistake of shipping small Duchess and calling them dessert pears. Now, a small Duchess is not more likely to be bought because you call it a dessert pear, and the British buyer objects to being misled. Next is the Louise Bonne, a productive autumn pear. The Bosc is extremely popular, perhaps one of the most popular pears which we can grow for export, and is a good keeper. The Easter, or the Doyenne d'Hiver, is also a favourite pear for the winter trade. The Comice is also a great favourite. It comes from France and California, and is sold readily. The Glout Morceau is perhaps less popular. The Keiffer is not a high quality pear. It requires to be very carefully picked at the proper stage, and should be ripened thoroughly before it is eaten. It is a good canning or stewing pear, but even for that purpose it should be

properly ripened. It will be apparent to the committee that that makes the Keiffer a difficult pear for shipping to a distant market.

By Mr. Henderson :

Q. You mentioned the Keiffer as coming from France and California ; can all the rest of these be grown in Canada, say in the Niagara district ?

A. They all can be produced.

Q. Successfully ?

A. More or less successfully. They all have drawbacks. I might say that my purpose is to submit this information to such parties as the Ontario Fruit Growers' Association, with a view of their adding their experience and recommending officially certain varieties for growing and producing on this side. The Anjou, I should perhaps have mentioned before the Keiffer. It is more popular than the Keiffer. It has more sale, looks well and is a reliable pear. The Keiffer is apt to bruise, and shows black or brown spots if it is not carefully packed—if it has room to rattle.

Of grapes only two varieties I have seen safely carried to the English market and lasting after arrival there. There may be others, but I only saw these two. Rogers No. 4, or Wilder, a black grape, carries well, and its quality is excellent. I had some shipped which kept for fully three weeks after arrival.

By Mr. Ross (Ontario) :

Q. What did they retail for ?

A. These have not been sold in such quantities as to give us reliable information on that point. Vergennes is also a good grape of the red variety and a good keeper.

Of peaches, there is only one Canadian variety which has arrived in good order, and I think we should for a time confine our shipments to that variety. It is the Elberta, and must be of good size to sell well. It ripens well after being picked, and sells well.

MOST SUITABLE PACKAGES FOR EXPORT OF FRUIT.

Now, taking up packages, I would say, first, for common apples that the proper package is the barrel. The barrel is and will for some time be the best package for the bulk of the apple trade. It should be well made, with eight hoops, two each at top and bottom and four quarter hoops, two at each position, the object being, as is often said, insurance. If one of the hoops is broken, you have another practically in the same position to hold the package tight.

By Mr. Wilson :

Q. They are not usually made in that way ?

A. Perhaps one-third or one-fourth are made with the eight hoops.

Q. The apple barrel ?

A. The apple barrel. Seeing a cargo discharged in London or Liverpool will at once convince any one of the advisability of having eight hoops. If one of the six hoops is broken the barrel goes slack inevitably, perhaps it even breaks, but going slack means perhaps a loss of three shillings in the selling price of that barrel. The extra hoop costs about a cent or two cents a barrel. As an insurance it is very cheap, and the best shippers, I understand, are adopting it everywhere. It is the opinion of the trade in Great Britain that Canada would do well to adopt a uniform size of barrel.

By Mr. Henderson:

Q. Is that not the case now; does the law not compel a uniform barrel ?

A. The law provides a minimum size, but some use a barrel holding more than that minimum size contains. Bushel boxes holding about 40 pounds are very well

adapted for fancy apples, such as King, Snow (Fameuse), Wealthy, and so on. Choice Spies, really choice Baldwins and choice Greenings sell very well in these packages.

By Mr. Wilson :

Q. Are they not a little expensive for packing ?

A. Three of these boxes, I believe, may be sold for the same price as a barrel, and three will hold what a barrel holds.

By Mr. Robinson (Elgin):

Q. Are the boxes tight ?

A. They are usually tight, but there is a very great difference in tightness. The best box has a top and bottom that do not extend quite to the sides, leaving four corners for ventilation.

By Mr. Schell :

Q. How thick should the lumber be ?

A. The ends should not be less than $\frac{5}{8}$-inch, and preferably $\frac{3}{4}$-inch.

By Mr. Ross (Victoria) :

Q. Did you see any of the Tasmanian apples in boxes? I understand they use the boxes ?

A. Yes, they are in boxes, the sides of which are $\frac{3}{8}$ thick, not less.

A great danger is that shippers adopt the box as a substitute for the barrel. At present it is not a substitute ; it is only an alternative for the fancy fruit. The British trade are accustomed to looking to packages for fancy fruit, with every apple sound and good. If we in Canada ship ordinary common apples in boxes the trade is disappointed on making a purchase. They are apt to say, 'these are Canadian fancy apples, but they are no better than barrel apples,' and the price, if there are many boxes, will be depressed accordingly. Already some shippers in Canada have made a mistake in sending boxes. I cannot too strongly emphasize that we should not use boxes for anything but fancy fruit.

By Mr. Ross (S. Ontario) :

Q. What sized box would you recommend ?

A. The size is at present under consideration of the fruit growers' associations at different points, roughly 10 in. x 11 in. x 20 in.

Q. Holding about how many apples ?

A. About 40 pounds, depending on the size of the apples.

By Mr. McCormack :

Q. Does the use of the box make any difference in the freight ?

A. I am informed that the freight depends exactly on the weight of the package, although some shippers tell me that they are charged the freight on a barrel for every three boxes shipped. The boxes should, I think, have cross cleats on the ends, in order to prevent one box lying flat on the other. These will prevent the pressure on the fruit if the lower box bulges slightly, and will also allow the circulation of air. To prevent the ends from splitting if the grain is perpendicular a cleat across the end is an advantage, just below the top, and it also serves for carrying the package, and will allow the circulation of air about the package.

The third package is one of the egg-case variety, having cardboard fillers with a square for each individual fruit. This package is more expensive again than the bushel box, and the reason, therefore, is all the greater why it should be used only for choice fruit. Each apple shipped should be wrapped in paper to avoid 'rattle bruises.'

The package for pears, according to the universal opinion of the trade, is a half case, holding about 20 pounds net of fruit.

By Mr. Ross (Ontario) :

Q. The same as the California package ?

A. Very much the same as the California package. This measures, roughly, 4½ by 11¾ x 18½ inside. The ends are usually ⅞ and the sides ⅝. Some use a partition across the middle of these boxes and use lighter material for the ends.

Q. The box holds about four dozen ?

A. Four dozen or more depending on the size. Four dozen would be a large-sized pear. The Grimsby package is very like this California one. Every pear should be wrapped in paper; there is no exception to that and the fruit should not have room to rattle about ; only enough excelsior or paper shavings should be used to prevent fruit from rattling in the package. Some complaints were made last year that there was altogether too much packing in the boxes, and the purchasers were paying for excelsior instead of fruit. The bushel boxes may be used with fruit of really good carrying quality in cool weather, but it is not recommended.

Grapes have beeen carried well in crates holding eight five-pound baskets, each with a cover and a wire handle. Peaches have been sent from the United States in crates holding six or eight small boxes, also in half boxes smaller than the pears, every fruit being wrapped.

REQUIREMENT OF FRUIT CONDITIONS ON LANDING IN GREAT BRITAIN.

Now, the general requirements for fruit in Great Britain may be mentioned. It must be sound on arrival; condition is essential. Appearance is very important. The fruit should have a good colour for its variety, should be of even shape, and have a clean, fresh looking skin. Dull, spotted or misshapen fruit, even if sound, is not wanted by the best trade. Flavour is essential if a permanent and profitable trade is to be established. Fruit of inferior quality may sell on its 'face' for some time, but it is not likely to do so long. Size is important. Well developed fruit is most in favour. Extremely large size is not always a recommendation for apples, unless for such fancy varieties as the King, which may be sold by the dozen.

Small pears are not in demand; large handsome fruit is always wanted; even quality will not make up for deficient size in pears. I made inquiries about the Seckel pear, which is very small but of fine flavour. I am told it will sell, but not to advantage.

By Mr. Henderson :

Q. Before you leave this subject, I think the committee would like very much to know how the amendments to the Fruit Marks Act of 1901 have been received in the fruit-growing districts with regard to the grading of fruit. Do the fruit-producers generally approve of the amendments made last year ?. I have received different opinions. With regard to the grading, do the producers generally approve of the amendments made last year.

A. If you will allow me, sir, I have a department of my subject dealing with Fruit Marks Act, which I will deal with later on ; but just as you wish.

Q. All right, only I am going out of the room very shortly.

DISCHARGE AND SALE OF APPLES IN BRITISH PORTS.

A. I will deal now with the arrival and discharge of fruit in Great Britain. The fruit is discharged there from the ships by the following method : The apples are piled up three, then two, and then one, making a pile of six barrels, on a rope sling, one end of which is then passed through the other, and over a hook attached to the derrick. The six barrels are hoisted out of the hold to the deck, and are then rolled separately to the chute, sloping to the ground. If the slope is steep, a barrel here and there is

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turned endways, and men are stationed along the chute to prevent a rush. The chute is kept full. With slings the process is just the same, only the sling instead of being lowered to the deck is hoisted clear and then carried to the ground. The fruit is then taken out, and is placed on trucks ; in some cases the entire sling of six barrels is dropped to the truck, and is then carried away to the sheds. Sometimes hooks and chains are used. A dozen or more light chains are hung from the derrick rope, each having a pair of small flat hooks, which are attached to the ends of the barrel. This system is used to discharge from barges in the Thames, and works very rapidly. Trays—large platforms used for boxes or cases, which can be piled evenly upon them, are sometimes used. They are hung by chains attached to the corners. Rope nets are sometimes used to lift five or six barrels at a time without orderly arrangement. Storage and classification,—taking Liverpool first. Each receiver there has a set of experts who see the fruit stored in the immense covered sheds on the docks. There it is arranged according to shippers, and each mark is classified as 'tight,' 'slack,' 'slightly wet,' or 'wet.' Special lots are occasionally marked 'wet and slack,' 'very slack,' and so on. Catalogues are then printed in accordance with this classification, which, however, must be repeated if the sale is delayed any time.

By Mr. Ross (Ontario):

Q. How do they become wet ?
A. Sometimes by the fruit being crushed if the barrels are packed too tight.
Q. Would that be from the juice of the apples ?
A. It is from the juice of the apples.
Q. Will not the sweating do it ?
A. The natural sweating will not produce a wet package.

Intending buyers are entitled to open and examine any barrels they choose, closing them afterwards. In this way they can decide in advance what lots to bid on, besides having the receivers, men always under observation, so that the marks cannot be altered after the fruit arrives, neither can sample barrels for the sale be unfairly selected instead of being taken at random. Intending buyers are always circulating around on the dock among the men acting for the receivers, and it is not possible, as is sometimes suggested, that the receivers will have men there to add an X to the barrels marked XX on this side in order to represent the fruit as of first-class quality. After the auction the buyers send for the lots that they have purchased, and receive them at the docks.

At Glasgow there is a different arrangement. The fruit is there arranged according to receivers, the consignment of each broker being placed by itself ; it is then carted as soon as possible to the broker's warehouse, where the classification and the selection of samples is done. Intending buyers are there shown any packages which they desire to inspect and make notes to guide them at the sale. In London, as in Glasgow, the brokers take the fruit as soon as possible from the docks and select samples at the warehouses. In Manchester the Liverpool system is followed in the main.

Now for the sale by auction. At Liverpool the brokers are united into a strong association, and the sale of fruit is held in one large amphitheatre. The samples, which are numbered to corrrespond with the printed catalogues, are brought up from the basement for show by two hoists, which are located in the centre of the pit. One brings up a couple of samples and the other goes down to get fresh samples.

By Mr. Ross (Ontario) :

Q. You mean a sample barrel ?
A. Sample barrels, two of them come up at a time. One of these is usually dumped out into a large basket in full view of all the buyers, who then get a fair idea of how the bulk compares with the face. It is worth mentioning here, however, that these buyers are not the men who are going to consume the fruit, and it does not

always follow that because they see that a package is 'topped' they will not buy it; therefore, it need not be said that this dumping out of barrels over there makes it quite unnecessary to have any supervision on this side as to the honesty of the packing. Some of the fruit is consigned to brokers direct, and some is turned over to them by other dealers. In the former case there is one commisison, and in the latter there are two commissions; or, as it is put, the commission is divided. Many of the buyers are members of fruit firms and purchase for their own trade only; they come to Liverpool from considerable distances in order to do so; there is also a class of professional buyers who represent distant firms, and who make a fixed charge for their services of, say, sixpence per barrel, to cover all expenses at Liverpool, or accept orders at a price not to exceed a certain figure In Manchester there are three receiving companies who work on a somewhat similar basis to that of Liverpool, using a common saleroom. In Glasgow and in London the brokers are not united, but they hold separate auction sales, at or near the markets. Each broker has his own regular group of buyers, and then there are buyers who wander from rostrum to rostrum. One large firm in Glasgow has a private auction room, with a double elevator for samples, as at Liverpool, and here barrels are frequently turned out for inspection.

By Mr. Broder:

Q. All fruit is sold on sample, I suppose?

A. All is sold on sample, and in these sale rooms the barrels are frequently turned out as they are at Liverpool for inspection.

By Mr. Wright:

Q. How do they get the apples back into the barrel again after turning them out?

A. I do not think there is any great care to get them back in good order; they are afterwards sold as samples.

Q. Supposing a man buys 30 barrels, has he to take one of these sample barrels?

A. Not always. In Glasgow I have noticed that there is always a group of buyers there who are looking for nothing but samples; people who perhaps have very small shops, and cannot buy a lot of five, ten or twenty barrels for themselves. They therefore watch for samples, and the moment a sale is made, there are hands going up all over the amphitheatre, with the cry 'sample,' 'sample.'

By Mr. Broder:

Q. Supposing there are some slack barrels, what do they do with them? Do they sell them altogether?

A. They sell the whole lot of 'slacks,' whether they are better or worse than the sample; they are all sold on that sample; the classification is made, so that the 'slacks' are all sold together.

Q. But the fellow that is handling them is more interested in the buyers there than he is in the Canadian sending them. Who picks out the sample? There is the trouble.

A. The commission agent is interested in getting as large a price as possible, and the classification on the docks is also made in the presence, as I have said, of intending buyers, who will see to it that the 'slack' lots are sold by themselves, and that those which are classified as 'tights' are tight.

By Mr. Wright:

Q. It is the man who receives the fruit that picks out these samples?

A. He sends his men down to the dock to pick out the samples, which is supposed to be done at random. Elsewhere than at Liverpool and Manchester and this one broker's establishment in Glasgow, which I have mentioned, samples are not thrown out and the parties who have not examined the bulk are shown the surface of the barrel, and must buy from that. As a con-

sequence buyers take notes of how certain lots turn out, and when they come to buy again they are guided by these notes. For instance, I have seen a buyer at some of these sales take out a note-book when a lot was put up and have heard him say: 'No, that turned out badly last time,' and he will not bid on that lot. Then, in all places, especially in Glasgow and London, quantities of fruit are disposed of by private sale. Some salesmen have large warehouses where the fruit is stored and sold on its merits. It is the object of the salesmen to beat the prices made at auction on the same day. Then there is a considerable business done in filling orders solicited by travelling salesmen of the receivers. This tends to give a wider field for private sale operations, similar to that enjoyed by the auction brokers, and minimizes the danger of the dealer becoming over-stocked through not meeting enough buyers, which might lead to a sale at slaughter prices.

There is, as a rule, genuine competition among the buyers, but where the attendance is small at an auction, I have noticed that until a price is fixed, buyers hold back, and then clamour eagerly for a share in the lot offered. No one will buy until, say, 10 shillings has become fixed as a price, and then they will buy readily. This is tacit collusion which I do not think possible in a large sale room such as Liverpool.

By Mr. Broder :

Q. What is your opinion as to private sale or auction sale ; which do you prefer ?

A. I think the prices run about even. I should hesitate to express an opinion. Sometimes the private salesmen get the best prices and sometimes they get overstocked. When there is a large lot on the market an auction sale is the only way to dispose of it.

By Mr. Wright :

Q. That is my experience.

A. For large lots.

At Manchester, Bristol, Hull, Leith and Aberdeen there are received occasionally shipments from Canada, but Liverpool, Glasgow and London get the bulk of Canadian fruit.

Now I want to say just a word as to the views of the British trade as to Canadian fruit. In regard to apples, when good, they are said to be unsurpassed in quality and appearance, and they are always wanted when they arrive there in good condition. There is practically an unlimited demand for good fruit to retail at about 2d. or 3d. a pound. Above 3d. the sale goes off wonderfully. The demand is then restricted to people of means.

By Mr. Ross (Ontario):

Q. How many pounds are there in a barrel of apples ?

A. They call the Canadian barrel 140 pounds.

Q. That would realize about $7 a barrel when retailed ?

A. About that. That varies considerably of course.

FANCY FRUITS.

By Mr. Broder :

Q. There is a difference in the barrels ?

A. Yes. Now as to suggested improvements in regard to the shipment of apples. The trade say to send only sound, fair-sized apples. Poor ones are not wanted and tend to lower prices. This was particularly in evidence last year when the apples of Holland and Great Britain were as a rule of poor quality. There were plenty of poor apples, and Canada should have sent only the best fruit. Only the best fruit is needed, and our shipments should be made up of the best in the country. Then the dealers

say that we should send say ten per cent of fancy fruit in 40 pound packages. They say they could not handle more than ten per cent in this way at present. Then they ask for fewer small lots and fewer varieties.

By Mr. Smith (Wentworth):

Q. They do not want more than ten per cent of fancy fruit in boxes ?

A. No.

Q. Who objects ?

A. The chief objection is from the wholesalers.

Q. If the retailers had their own way would they not ask for more to be shipped that way ?

A. The most cautions would not, but some say 'send us all in boxes' ; the best dealers there want apples in boxes to the extent of ten per cent only.

By Mr. Broder :

Q. Is not your experience that boxes are not made of heavy enough lumber ?

A. They are not made heavy enough.

Q. The barrel is the best package for shipping apples, but they may be bruised in them ?

A. Yes, if not properly packed.

Q. They can be pressed in ?

A. They can be pressed in to boxes too, but they must go in in layers.

By Mr. Ross (Ontario):

Q. Like oranges ?

A. Yes.

By Mr. Wright :

Q. Some are packed like eggs ?

A. Yes, Snow apples.

By Mr. Smith (Wentworth):

Q. What is your experience as to apples going in such cases ?

A. I have mentioned that I do not think it will pay, except for the largest fruit, fancy fruit, such as you can afford to wrap and pack separately.

Q. When you speak of boxes you refer to the ordinary 40-pound box ?

A. Yes, bushel boxes.

By Mr. Ross (Ontario) :

Q. You never pack apples in boxes without wrapping them like oranges ?

A. Yes, we do. The tenderest will be benefited by wrapping, but it is not always necessary.

Q. Well, do they not turn out better when they are wrapped in paper ?

A. It is an additional and, according to my view, unnecessary expense for most varieties. There is such a thing as a fancy Spy or Baldwin. I saw fancy Baldwins bring 10s. 6d. a bushel box when good Baldwins were only bringing 10 shillings. That means at the rate of over 30 shillings a barrel. That was unwrapped fruit, but it was good.

By Mr. Smith (Wentworth) :

Q. How much of that difference do you attribute to the box ?

A. That would depend on the buyer. If the buyer is a man with a fancy store and with only fancy fruit, he will pay for the package as well as for the fruit, and will show, as I saw in an Edinburgh store, a row of these boxes as part of his window display.

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Q. Do they sell them by the box ?

A. Yes, and also by the dozen.

Then fewer lots, as I was saying, are wanted ; larger quantities in the individual lots. They ask for fewer varieties and for fewer mixed lots. By mixed lots I mean five or ten Baldwins, three or four Spies, some Russets, and so on. It will be highly desirable to collect large lots of one variety on this side and ship them to the one market. Grading should be carefully done, and should be uniform, so that the bulk of the fruit is true to sample. Samples will not tell buyers much unless they are carefully graded, and it is greatly to be desired that we should get our fruit graded uniformly. Then, the stencilling should be done distinctly and carefully, not by lead pencil, but with a good rubber stamp or brass stencil. The trouble does not result from ignorance, because the shippers know very well the varieties, but it will happen that certain barrels of Baldwins will be put with a lot of Greenings, say, and a man stamps all the barrels 'Greenings.' Then when the buyer purchases these barrels as 'Greenings,' and finds that he has been deceived by the stencilling, he is apt to put it down to sharp practice on the part of the shipper. Shippers must pack honestly so that sales may be safely made by the shown surface. This will save much time now spent in examination. Then the shipper should send his brand regularly to the same market and the same brokers or buyers, who will learn to know its value, and will compete for it, and a reputation will thus be made.

Then it is asked that all fruit should be in three grades, No. 1, No. 2 and No. 3, to be defined : No. 1 as in the Fruit Marks Act, section 6, at present ; No. 2, in the same way to exclude culls ; and No. 3, culls.

Regarding Canadian pears, it is the general opinion that a large trade could be established if shipments are confined to a few popular varieties which carry well, and if only large sized sound specimens are sent.

THE FRUIT MARKS ACT.

By Mr. Henderson :

Q. Will you answer my question, you are passing over what you were going to say about the Fruit Marks Act ?

A. I have it all here, sir.

Q. I simply wish to know how that amendment was received by the growers and by the shippers. Has it met with favour; is it approved of ?

A. You are now speaking of conditions on this side of the ocean ?

Q. Yes.

A. On this side, of course, my experience is limited, as I was away last year, but as far as I know the trade was very well satisfied except in one or two small sections. I have heard only one objection.

Q. When you say the trade you mean people who are buying apples from the producers and shipping them ?

A. No, I mean here the growers. It is the growers I have met since I returned, not the dealers. I find them all very well pleased.

Q. I have understood that the growers are not satisfied, but that the shippers are satisfied.

A. As I say, I have heard only one objection.

Q. From what part ?

A. From the Burlington district.

Q. I was speaking of Burlington. I know the objection is very strong there.

A. I met the growers there some time ago, and the matter was discussed at some considerable length.

By Mr. Blain :

Q. What are the complaints ?

A. The complaint is put in this way, that the present amendments 'require a farmer to do what it is impossible for him to do, namely, to grade uniformly all the apples in Canada.' That is exactly the way it was put to me by a leading speaker at Burlington some time ago. The answer to that objection, if I may make it, is that the grower is *not* expected to concern himself with any apples except his own, that in grading his own apples he has for a guide a very clearly worded description of No. 1 fruit in the Fruit Marks Act. For the lower grades there is no description, neither is there any responsibility on the grower, and I should judge that no one knows as well as the grower himself what grade he is putting into each package.

Q. Were any No. 3 grade apples packed at all ?

A. Yes, some were marked No. 3 and some No. 2.

By Mr. Wright :

Q. Some were marked No. 3 ?

A. Some were marked No. 3, oh yes.

By Mr. Robinson (Elgin):

Q. Do you say you have met the fruit growers of Burlington ?

A. Yes, I have met them since New Year's.

Q. And they lodged a complaint to you ?

A. Yes.

Q. Do you think there is any remedy for them ?

Q. I cannot honestly say that I think there is need of a remedy.

Q. No need of a remedy ?

A. I do not think so.

Q. You do not think there is any need of a remedy ?

A. There is no further responsibility placed on the growers by this amendment. I might explain the amendments. Last year the Act read that on every package there must be 'a designation of grade,' and the Act is now amended to say what shall constitute 'a designation of grade.' These designations of the following shall include one of the following marks : 1, 2, and 3, or XXX, XX and X. Now, there is nothing to prevent a grower after placing one of these marks on a package from putting on any other mark he wishes.

By. Mr. Broder :

Q. A private mark ?

A. A private mark.

By Mr. Stephens :

Q. If the producer sells to a packer the onus is on the packer and not on the raiser?

A. Quite so.

By Mr. Cochrane :

Q. It does not put any more responsibility; and if it does not put any more on the packer what is the good of the amendment ?

A. We had last year many inquiries as to what is meant by 'a designation of grade.'

Q. X's are a designation of grade, are they not ?

A. And so are numbers 1, 2 and 3 .

Q. The original bill provided for designation 1, 2 and 3, or XXX, XX and X ?

A. That was what the amendment provided.

APPENDIX No 2

By Mr. Robinson (Elgin):

Q. Is it not a fact that designations varied with different men ?

A. That is true, and that is one reason for the passing of the amendment. We had something like 50 different designations of grade used by shippers via Montreal last year, which was very confusing to the trade. It was therefore thought well to adopt the system of X's and numbers, and explain to every one that a designation of grade meant one of the six marks.

CANADIAN PEARS IN ENGLAND.

With regard then to Canadian pears, I was stating that there would be a considerable trade done in pears if a few popular varieties which carry well are sent forward.

By Mr. Cochrane :

Q. Which would be the popular varieties ?

A. I mentioned those some time ago. The Bartlett, the Duchess, the Louise Bonne, the Bosc, the Easter, the Comice, the Glout Morceau, the Keiffer and the Anjou. Until the reputation of Canadian pears is established, the fruit should be offered in open market. Orders for direct supplies may come later on. I had a very encouraging letter from a large London house with reference to the quality of some of our pears.

By Mr. Smith (Wentworth):

Q. Where did most of the pears come from ?

A. Those shipped last year were chiefly from the Niagara district.

Q. How do our pears compare with those from California and France ?

A. A Canadian dealer in Glasgow told me that there is no comparison between a properly matured Canadian Duchess, and those brought in from France. Ours are very much superior. Of course, last year was a very bad one for the French pears, and we may not always excel them to the same extent.

Q. Does the English crop play an important part in the market ?

A. It does not.

Q. What about the shipments of Canadian Bartletts last year; how did they come in ?

A. Quite a number were received. Some were in good condition; others were too ripe.

Q. To what do you attribute their arriving in an overripe condition ?

A. Without being on this side I could not tell. Probably they were either picked too ripe, or they were heated.

Q. Did you have the thermograph readings on that side ?

A. No, they are sent to this side.

Q. They are not opened on that side ?

A. No.

By Mr. Robinson (Elgin):

Q. Did you hear anything about a shipment of pears from the Burlington district being spoiled ?

A. I saw some of those badly damaged.

Q. Were they spoiled in cold storage, or what was the cause of their being spoiled?

A. That is rather an involved question to answer off-hand. I was not on this side of the ocean when they were shipped.

By Mr. Smith (Wentworth) :

Q. When the Bartletts arrive there in good condition, the trade is profitable ?

A. Yes, I think they would sell profitably. I may say I have received to-day from Great Britain advice that the pears in France and Italy and England are in bad shape this year.

By Mr. Broder :

Q. Too cold ?

A. They have suffered from the cold, so we may perhaps expect a repetition of the good opening for our pears.

By Mr. Smith (Wentworth) :

Q. Does the price of pears not advance towards the end of the season ?

A. I think so.

Q. The markets are generally overstocked in the Bartlett season ?

A. They are more apt to be.

Q. How late in the season were you there ?

A. I was there until the middle of January.

Q. Were any winter pears sent there from the United States or Canada ?

A. Not from Canada, that I saw. There were some from the United States, and they sold very well. I may say that the opinion of the trade as given to me was that about the middle of December was the latest we should have our pears there if we wanted to find a good market. On the other hand, I find the quotations for pears are still keeping up. Good prices are being given for winter pears such as Easter.

I shall now say a word as to the Fruit Marks Act on the other side. Previous to 1901 the trade was in very bad shape. Highly faced barrels were apt to be found filled with trash. There were a great number of grade marks, and the grade and the shippers' name were sometimes fictitious. Many dealers on the other side were disgusted, and told me they had decided not to buy any more Canadian fruit. The condition as represented last year was that the fruit was true to name, and the grade marks were reliable. Whether this was the result of the amendment, I cannot say, but people now tell me they have confidence in the X's as used by Canadians.

By Mr. Heyd :

Q. A remarkable coincidence ?

A. Quite.

By Mr. Smith (Wentworth) :

Q. Formerly some shippers had a great many X's.

A. Seventeen or twenty. Now, the dealers tell me they can buy three X's, and know they are getting something reliable. This, a typical comment, was that of a Bradford dealer : ' There used to be shameful fraud in the packing of Canadian apples; this year we have none ; there must be some new idea out in Canada, but I do not know what it is.' That is because the bulk of the trade was done in compliance with the Fruit Marks Act.

By Mr. Heyd :

Q. That new idea would be ' honesty ' in packing ?

A. I think it was, and in marking.

Q. Brought about by the amendment to the law ?

A. It was a moral reform, I think. Lots of those who remarked the absence of fraud last season, were ignorant of any legislation on the subject. I mention that fact so that you will know that the views they offer are impartial. Those who know the provisions of the Fruit Marks Act unite in asking that it be rigidly enforced, and that the second grade be limited so as to prevent the wide range of quality in fruit marked No. 2 or XX. Under the present Act, which defines only the first grade, any fruit whatever may go into the second. The dealers want a distinct class for culls.

APPENDIX No. 2

By Mr. Smith (Wentworth) :

Q. Do you think that if the buyers on the other side were satisfied that the fruit marked No. 1 on this side, fruit that is sufficiently good to pass inspection on this side as No. 1 could be safely accepted by them on that marking that a profitable trade could be carried on with merchants in the old country direct, instead of selling by commission ?

A. There should be a profitable trade in direct business, but my present opinion is that it should be conducted on this side, as some of the firms over there have done this year. One dealer sent a representative to Montreal, and there the sale was completed and it worked very successfully.

By Mr. Stephens :

Q. You mean the Canadian responsibility ended in Montreal ?
A. Yes.

By Mr. Smith (Wentworth) :

Q. That is the result of sending apples that were really what they were marked as being. If the dealer were not sure about that he would have rejected our apples at Montreal, and would want to inspect them again on their arrival on the other side ?

A. I cannot say as to the motives of the man, who was a new man in the business, but he thought it best to make complaints if he had any to make when the fruit was at Montreal.

Q. In the case of the small dealer, who would buy a carload or two, if he were satisfied that the grade XXX was to be relied on as representing the quality of the contents, is it not reasonable to suppose he would be willing to buy car lots on this side ?

A. Quite so, and that is what some of the trade over there are very anxious to do.

By Mr. Broder :

Q. Is it safe to ship any culls at all ?
A. I am of the opinion that it should not be done at all.

I spent a few days in the pear country of France with the view of ascertaining whether we could learn anything from the people there with regard to the packing of fruit for the export trade. The export pear trade is reduced to a science in France, especially by certain thoroughly organized firms. Under this system the fruit purchased in widely separated districts in France is uniformly graded, packed and marked. Orders are received by telegraph at Paris, or at the London office of this organization, and each day's pack is shipped on instructions from the head office in Paris, and the purchasers can sell the packages again with the fullest confidence without even seeing the goods.

By Mr. Smith (Wentworth) :

Q. Is it not natural to suppose that the same result will be attained by us when our grade is thoroughly established ?
A. That is what we hope for.

By Mr. Broder :

Q. They have the advantage of distance, though.
A. Quite so.

By Mr. Blain :

Q. What effort has the department put forth to give the dealers in the old country, and the consumers also, a thorough understanding of the provisions of our Act ?

A. I issued a circular whilst there telling briefly the requirements of the Fruit Marks Act, and asking the co-operation of the trade on that side tending to its rigid enforcement. The circular was placed before the Federation of Retail Fruiterers in my absence ; they have informed me that the circular appealed to them in such a way that they have had 25,000 copies printed for distribution throughout the trade.

Q. What did the circular set forth ?

A. With the circular I sent to each important man in the trade a copy of the Act. The circular referred to that copy and briefly described the requirements of the Act.

Q. What about the consumer ? Has he any opportunity of learning what the Act is ?

A. No, except through the press. A letter, however, was sent to a Glasgow paper, which published it ; it was headed, 'How to buy a barrel of apples,' and then portions of the Act were quoted to show what fruit might be expected to be found in a barrel bearing certain marks. It was also shown that it was required to be honestly packed, according to the marking, and that the purchaser should complain if he did not find the fruit come up to that standard. That was very widely published, and similar articles were sent to the press from time to time.

Q. These are being published in the leading centres, I suppose ?

A. In all the leading centres : London, Manchester, Liverpool and Glasgow.

By Mr. Richardson :

Q. Would it not be well to publish a circular to show the result so far attained in the increased confidence of buyers in Canadian packers and published in the Dominion press ?

A. I am of opinion that good work might be done in that way.

Mr. SMITH (Wentworth).—I think it would be a very good plan indeed to have the consumer get to know these marks. In Manitoba last year a man sold a car of apples marked X to a consumer direct, and made him believe that XXX was a dangerous grade to buy ; that too many X's on the barrel were not good, and persuaded the customer that XX or X was better still, that it sometimes turned out that the more X's there were on the package the worse the fruit was.

By Mr. Broder :

Q. Is there no way of tracing the apples back to the original owner or grower ?

A. Not by the consumer ; but I am of opinion that the retailer will do that far more effectively than the consumer in any case. The consumer who buys the individual apples has no chance to trace the fruit back, whereas the retailer who buys a lot of, say, ten barrels, if they are fraudulently packed, can easily trace them.

Now, with regard to the French method of packing and shipping pears. The pears are carefully picked, while still hard, into baskets, and are taken to the dealers in large hampers, well lined with straw. They are then hand sorted according to size, all defective fruit being returned to the grower, and are placed on broad canvas-covered tables, each size by itself. The grading is done by women without any aid to the eye after they have become accustomed to the work. Girls and women do the packing into crates made of slats, with the lids tied on by cords. The thick mat of excelsior is covered with newspapers on which is placed the fruit in layers followed by newspaper, excelsior, paper, fruit, paper, excelsior, paper, fruit and so on.

By Mr. Heyd :

Q. Are they set on ends or sides ?

A. On sides, flat. The covers are tied down with cords. This is a man's work.

APPENDIX No. 2

By Mr. Broder :

Q. How many pears in each ?

A. It depends on the size of the fruit, from 48 to 64.

Q. Fruit ?

A. Individual pears. A code of marks is used to indicate the number of fruits, variety and place of origin of the pears. Only five or six days intervene between picking and selling in the British markets. Meanwhile the fruit while protected in a measure from heat, ripens slowly. It is put on the market in first-class condition to last a week in the hands of the retailers.

By Mr. Smith (Wentworth) :

Q. They will last a week ?

A. 'Duchess' will last. I had a box of Canadian Duchess which lasted three weeks or more.

Q. Are they sent in cold storage ?

A. No, they are only protected in the way I have mentioned.

Q. Is that sufficient ?

A. That is sufficient.

By Mr. Broder :

Q. The dealer takes no care to keep them in cold storage ?

A. No.

By Mr. Smith (Wentworth) :

Q. Is there any effort to put them in cold storage ?

A. Not that I know of. American pears are covered with tarpaulins while in the railway cars. The men sometimes trample over the fruit on the tarpaulin. They go to London into great cellars and are sold by sample.

Q. And do not go into cold storage ?

A. No.

Q. Don't they come out wet ?

A. The package may be slightly wet, but the air carries off the moisture as it condenses.

Q. Will they dry off so that the dampness does not show ?

A. They do dry off. If they are got out quickly to sale, we find that they are damp, but if long delayed the air seems to dry them off.

Q. How long will they take to dry off ?

A. It depends on the temperature, the humidity and how the air gets to them. These packages, which the French shippers use for pears, cost about 30 cents each and are returnable, but are said to last for only six or seven trips. The return freight is also said to be expensive. Now, while eminently successful for short journeys, these packages are too expensive and too bulky for our export trade. When the weather is hot the thick mats of excelsior would be a bar to cold storage, and when it is cold these mats would be unnecessary. So I do not think we can learn much from the French except :

1. To grade carefully so as to have only one size in a package ;

2. To exclude rigidly from our exports all undersized or defective fruit ;

3. To adopt packages of uniform size for all Canada, which shall be the same from year to year. We cannot establish a satisfactory standard when the buyer does not know just what that standard is.

By Mr. Broder :

Q. Is the American barrel smaller than ours ?

A. Rather. They vary considerably. The Maine barrel is lower.

By Mr. Smith (Wentworth) :

Q. California pears go in 40-pound boxes ?

A. No, usually in the half case which the trade recommends.

Q. And ripe ?

A. They have some pears which come in the 40-pound boxes. I saw Keiffer pears from the States coming in half cases, boxes and barrels. I will not say I saw fruit in barrels, as the staves only were remaining on the cellar floor. The barrel is not satisfactory for Keiffer at all ; boxes do better and the half case best.

Q. Have the people got on to a liking for the Keiffer, do they want it ?

A. Some do and some won't have it.

Q. Those who have had it do not want it ?

A. Yes.

Q. There are a good many left, to last for several years, who have not had it ?

A. Yes.

Q. Not many Keiffers go from Canada, are there ?

A. Not many. There were some shipped in barrels, which were very bad.

CANADIAN FRUITS IN CONTINENTAL MARKETS.

Now a word with regard to the possibility of extending our continental trade. Returning from France by way of Belgium and Holland, I was obliged to make a hurried trip to England in order to be there for the arrivals of fruit. I had only time to make a few inquiries. In Germany, fresh fruit will be in demand if it is of the best, that is, when the European fruit is sold out or in a season like last when it was a failure. The German trade likes a red apple such as the Baldwin and Ben Davis, in 40-pound boxes. I have no particulars whether that is the package for all fruit or whether fancy fruit only is wanted in it, but it is a fact that the German trade does not want our poor product in any packages.

Q. The German apples do not keep long ?

A. They are about done in February.

By Mr. Broder :

Q. The red apple is the favourite in Europe ?

A. Generally.

By Mr. Smith (Wentworth):

Q. And what time would you send them ?

A. After February.

Q. What was the usual condition of Canadian apples when arriving there ; were they uniformly sound ?

A. On the whole, they were sound, if we except the spot so greatly complained of.

Q. Were there indications that they had been over-heated, that they had been in a warm place, that the spots had grown, and that some had little rotten dints ?

A. Sometimes. On the whole, the arrivals of American fruit, like the Canadian, were not satisfactory.

Q. For what reason ?

A. The quality was not good.

Q. They were affected with fungus.

A. Yes, they showed fungus, and the Baldwins on the whole were not well coloured; they were dull, and the Greenings were badly spotted, though there were some good lots Intending shippers to Germany should begin with small consignments on commission. These will lead others to Germany and to other European countries, and be

successful if the packing and grading is reliable. Germany is not a market to be exploited with poor fruit.

By Mr. Heyd :

Q. They know the value of five cents ?

A. If necessary the fruit can be repacked in cold storage at Hamburg. Possibly the same can be done in Rotterdam.

By Mr. Smith (Wentworth) :

Q. Is there any duty on apples in Hamburg ?

A. There is no duty on fresh fruit at present.

Q. Is there any in German cities and German provinces ?

A. In the interior of Germany there may be local duties in towns as there is in France. I might give the committee the prices realized by a Canadian grower who shipped to Hamburg. For No. 1 Greenings the average price he received was $4.85. His expenses were : Freight to New York, 38 cents ; New York to Hamburg, 75 cents; cold storage, 25 cents; commission say 17 cents—that is a total of $1.55, leaving a net return of $3.30.

Evaporated apples are in great and constant demand in 25 and 50-pound boxes. The price varies from time to time. Cores and skins are wanted ; also dried apples in casks. That trade is being developed already, and for evaporated apples again quality is essential.

By Mr. Heyd :

Q. What do they do with the cores and skins ?

A. I understand they are used to make cider or marmalade—apple marmalade.

Q. What do they use for dyeing, I understand they dye with dried apples ?

A. I was not aware of that.

In Holland there is a duty of 5c. on each barrel of fresh fruit. It is not greatly in demand unless there is a failure at home. A great deal at present is exported to France and Britain. On tinned apples there is a duty of about $5 per 110 pounds. On dried apples there is also 5 per cent ad valorem duty. Ordinary grades are not much in demand, but fancy apples sell well. Rotterdam is the chief distributing point for Holland and for part of Germany. Freight from there to Western and Southern Germany is less than it is from Hamburg. Large quantities of American fruit are arriving annually.

In Belgium fresh apples are free of duty and pears pay a cent a pound. Spies and Greenings in boxes strictly first class may do well in small quantities. Dried apples pay a ten per cent ad valorem duty, and in them there should be good business if they prove satisfactory.

The chief obstacle to expansion in the continental trade is the want of confidence on both sides. If there were a thoroughly reliable Canadian speaking both languages in each of the great centres, as distributing agent (dealing with the wholesalers only), or acting as arbitrator in disputes, much would be accomplished towards establishing a permanent trade. As it is now, the shipper is not sure that when a complaint is made that it is a just complaint. The receiver, on the other hand, does not feel confident that the shipper who sends him fine apples to-day will continue to send fine apples when he begins to order largely.

By Mr. Smith (Wentworth) :

Q. Would that not be obviated if the fruit were inspected and guaranteed by inspection on this side ?

A. If it were possible to inspect every package ?

Q. They would not need to do that. They do not do that when they sell in the Old country market.

A. Yes, but they buy just small lots at a time, and complain, and sometimes get a refund in the old country, if they are not satisfied. I do not know that they would be prepared to buy a large quantity in Canada if guaranteed on the inspection of a few packages.

The Canadian immigration agent in Amsterdam offers to look after the interests of any Canadian shipper who requires his assistance.

By Mr. McGowan :

Q. Would it be possible to inspect the finer varieties on this side, supposing the shipper was willing to pay a larger fee for inspection. I do not mean a general inspection all around, on every shipment, but speaking of this finer fruit, would it give the people over there any more confidence ?

A. I do not know that it would. A reputation is very easy to build up. I am speaking now of Great Britain again. If a man sends uniformly good fruit for three shipments he is known and his arrivals are watched for, and there will be competition for them.

Q. It would be the best way to establish trade there.

By Mr. Smith (Wentworth) :

Q. He could give a fairly good certificate to a car of fairly good grade without having to open every package ?

A. There would be very serious complaints and criticisms on the other side if a car marked a certain grade contained a few packages that turn out to be inferior, or perhaps one half inferior.

Q. If an inspector opens every barrel or one in every twenty and found them No. 1, it would be unlikely if he examined a larger number that he would find them inferior ?

A. There should be no objection to a certificate that (say) 15 barrels had been examined and found so and so.

INSPECTION OF FRUIT IN CANADA, UNDER THE ACT.

Now, if the Committee wishes, I can say a word or two about what has been done on this side of the water in the way of inspection under the Fruit Marks Act.

Twelve inspectors have been engaged during the year, or for part of it, and the total inspections reported to date are 2,284. Of these 814 were reported on in 1901-2, and 1,470 in 1902-3. The total number of inspections reported during the last season was 1,470. The total number of packages in the lots inspected, was 154,022. The total number of barrels opened was 7,816, and the total number of boxes opened, 525.

I have here a summary of the Montreal inspections in 1902-3. The number of shippers whose goods were examined was 308. The total number of inspections reported on, 812 ; the total number of barrels in the lots inspected, 114,582 ; the total number of barrels opened, 4,412; the total number of boxes in lots inspected, 16,388.

By Mr. Robinson (Elgin) :

Q. What do you mean by opening barrels ? The heads taken out ?

A. Opened in one way or another.

Q. Examined through and through ?

A. Examined thoroughly.

The number of lots branded falsely marked, 30; the number branded falsely packed, 6.

APPENDIX No. 2

Then there were certain prosecutions as follows: In Ontario, in 1901-2, there were 9; in Quebec, 1; in Nova Scotia, 2; a total of 12, all resulting in convictions.

In 1902-3 there were in Ontario 15, in Quebec 1, in Nova Scotia 6, in Manitoba 14, a total of 36.

Q. Have you the names there ?

A. All of which resulted in convictions. No, I have not the names here.

By Mr. Smith (Wentworth) :

Q. They paid the fines ?

A. These have all been fined, and, I believe, all have been reported from time to time in the newspapers.

By Mr. Robinson :

Q. Their names ought to be made public.

A. These prosecutions have all been reported in the newspapers.

By Mr. Smith (Wentworth) :

Q. The fine is 25 cents per barrel on the number of barrels condemned ?

A. That is the minimum fine.

By Mr. Stephens :

Q. It would be a good thing if the English people knew that these people have been punished for wrongfully marking and packing ?

A. I have here to hand a copy of an English fruit journal, which contains a report of the prosecutions which I sent over. I will give a classification of the prosecutions which have taken place according to the sections of the Act under which they were made.

In 1901-2, under section 5, the number of prosecutions was three, under section 6 there was one, under section 3 there were eight, and under section 4 of the Order in Council, there was one. The Order in Council provides that no person shall pack fruit, even for another person, contrary to the provisions of the Act.

In 1902-3, under section 5 there were nine prosecutions; under section 6 there were twelve; under section 7 there were fourteen, and under section 4, 'Order in Council,' one, making a total of 36.

By Mr. Blain :

Q. Were all those cases in connection with apples, or were other fruits included ?

A. There was one prosecution with reference to peaches.

Q. With reference to the enforcement of that fine of 25 cents per barrel, has it been customary on the part of the magistrates to increase the minimum fine and make it a real penalty ?

A. The magistrates appear to have a great reluctance to go beyond the minimum penalty, but in one case, at least, the parties have been warned that if they appear again there will be a severe penalty. In cases of infringement of the Order in Council, where the maximum penalty is $50, one packer was fined $30 and costs. The Glasgow *Herald* of the 29th December contains the following :—

'Recent legislation in Canada has done much to remove complaint as to the marking of packages and the quality of the fruit. It is perhaps only fair to add that in many cases the farmers or growers are not responsible for the shipment of the fruit. From them it is largely purchased in bulk from agents and middlemen. The methods now adopted are conceived in the interests of the fair dealer and of the public, and it is satisfactory to learn that during the short period they have been in operation they have in a great measure served the purpose in view.'

The following is an extract from a letter of Thomas Russell, Esq., fruit broker and auctioneer, Glasgow, Scotland, dated January 10, 1903 :—

'In reference to the packing of apples in barrels, there can be no doubt the passing of the Fruit Marks Act in 1901 has had a most beneficial effect in improving the grading and marking of fruit, but something still requires to be done in the way of defining No. 2 grade. While in many cases apples branded XX have given entire satisfaction, on the other hand, a great quantity of very inferior fruit has been packed under this grade, fruit which ought never to have been shipped at all, and would not make a decent X grade.'

The following is an extract from a letter from Messrs Simons, Jacobs & Co., Glasgow, Scotland, dated January 7, 1903 :—

'We do not think it would be well to base any action upon the present season's experiences. It has been unusual in this respect that the crop has been enormous, and the quality, as a general rule, not equal to that standard which we have always been accustomed to look to from Canada.'

Messrs. W. Nicholls & Sons of Manchester, England, in a letter dated January 13, 1903, write as follows :—

'You will of course have noticed in our conversation that we are in favour of all and any means of ensuring the Canadian apples obtaining and retaining the confidence of the buyers (wholesale and retail) and of the general public. We are now, and shall be very willing to do all in our power to aid you and your department in your endeavour to this end, which end we are confident is the best means towards the ultimate benefit of the Canadian grower and dealer. We have already mentioned these matters to the Liverpool Fruit Buyers' Association with a view to their reporting any case of false packing or false branding in your department, and we propose also laying the matter before the Smithfield Market Tenants' Association.'

From the report of the Conference of the National Federation of Fruiterers which was held in Birmingham, England, last month, I have taken the following extract :—

'Mr. Paterson, of Liverpool, gave an interesting description of his visit to Canada, and his travel of 2,500 miles in pursuit of information that would be of service to the English fruit trade. He spoke in eulogistic terms of the splendid endeavour of the Dominion and provincial governments of Canada to place on the English markets apples of the finest quality and in the primest condition.'

The London, England, correspondent of the 'Farming World' writes as follows :—

'Where the Canadian fruit scores is in the packing, for the efficient inspection of the government officials renders it very rare that a faulty consignment is put upon the market.'

The Winnipeg 'Commercial' says :—

'The freedom with which the grower and speculator have been able to pass bad fruit off on the defenceless consumer of the west in the past has created the impression in the minds of these that this market exists for the special purpose of providing them with a dumping ground, and it was hardly fair to expect that in one short season the Dominion Fruit Marks Act would succeed in correcting all the abuses arising out of such an impression. It is satisfactory to know that a good start has been made, and that the ground is now clear for a more aggressive campaign against all fraud and deception next season.'

And finally I would read you an extract from a letter to one of our inspectors from Mr. J. Taylor, who represents some English houses in Montreal. He says :—

'I would say that I have always found the inspectors, in the exercise of their duty, most careful, and desirous of leaving the packages opened by them in as nearly as pos-

sible the same manner as found by them; in fact I have known them to go out of their way to close barrels found on the wharfs in a broken condition or badly coopered, and to enter complaints to the heads of the departments of the different steamship companies when they have seen the fruit badly and roughly handled; and I say all this from my own personal observations of their actions and methods during the past two or three seasons, particularly the present one, when the duties are both arduous and trying in every way.'

By Mr. Smith (Wentworth) :

Q. What assistance did you have over there, Mr. MacKinnon; were you alone ?

A. I was alone. There are inspectors at all the ports watching the landing of Canadian products, and these gentlemen assist me by reporting now and again on fruit.

By Mr. Broder :

Q. That is as to how it is handled ?

A. As to how it is handled.

By Mr. Smith (Wentworth):

Q. What is their report as to the arrivals on the boats ; is there not a great difference in the condition of the fruit ?

A. Yes, there is a great difference, but these men report to the department direct.

Q. What is their report on, say three or four shipments ; is there not a great difference in the condition on different boats ?

A. There has been a great difference and no satisfactory explanation. There has been a great difference in the same boat on different voyages ; the condition of the fruit on the same boat on one trip will not be as good as on another.

By Mr. Broder :

Q. A rough voyage would have something to do with it ?

A. It would.

By Mr. Smith (Wentworth) :

Q. Did you make a record or keep notes of the conditions of these different boats?

A. Not with the object of seeing which boat carried best.

Q. You do not know whether the inspectors did or not ?

A. They report on every steamer.

By Mr. Broder :

Q. They report here as to the loading and the men at the other end report the condition on arrival ?

A. Yes.

Q. Who does he report to ?

A. The reports come to Professor Robertson.

By Mr. Smith (Wentworth) :

Q. Were there any Canadian peaches on the market last season ?

A. Yes, but they were picked too small and too green and did not ripen and never would ripen.

Q. Some shipments come from California ?

A. Yes, Elberta, principally.

Q. They arrived well ?

A. They arrived in splendid condition.

Q. What did they sell at ?

A. The price varied; in London the first lot in August, if I remember right, were sold at 10s. a crate. Half cases brought four to five shillings in October.

Q. What sized crate ?

A. Not more than 30 pounds.

Q. Where do they get their supplies from ?

A. Of peaches ?

Q. Yes ?

A. They get a great many from France and the Channel Islands, but a great many from the hot-houses. The very best come from the hot-houses.

Q. And are these prices you mention the average prices for peaches from France and the Channel Islands ?

A. No, there is a great variation.

Q. What sort of packages do they use ?

A. A very shallow box, containing a half dozen peaches packed in cotton, sometimes a dozen. They sell these according to the size of the fruit and its appearance.

Q. Do you know about what our peaches will have to sell for to make trade profitable ? Would you consider the prices for the Channel Island peaches satisfactory ?

A. I think there is no question about obtaining proper prices if we land the fruit in good condition.

Q. How is it the market is not cut down in price ? They can grow any amount of peaches in these places.

A. Fancy hot-house peaches fetch as much as 60 cents each.

Q. Why can they not flood Great Britain from Spain and France ?

A. They do not do so.

Q. The prices are all satisfactory ?

A. I think we could get more for our peaches than is being paid now because the Elberta is a larger and better peach.

Q. Which is preferred, the white or the yellow flesh ?

A. Yellow seems to be the favourite. The majority of fancy peaches on sale were yellow flesh.

By Mr. Stephens :

Q. Is it your opinion that we do not receive to-day more than one half as much from our fruit in Ontario than we would if our fruit was better picked, packed and shipped ?

A. I think that perhaps that is not too much to say.

Q. That has been my experience in my town.

By Mr. Broder :

Q. That would lead to a smaller quantity being shipped ?

A. Yes, and to freight and labour being saved.

By Mr. Smith (Wentworth) :

Q. Not to smaller shipments; its effect would be to secure the growth of larger peaches.

No answer.

By Mr. Blain :

Q. Have you any information as to the trade between Ontario and the North-west and Manitoba in the fruit business ?

A. I have little in addition to what has been published. Commercially the situation is simply this : the West will take a large quantity of good fruit, and I believe from this on an increasingly large quantity of good fruit, but if Ontario fails to send

good fruit, nicely packed, the West will bring fruit for its supply from British Columbia and the northern states.

Q. What increase was there in the amount of fruit sent from Ontario to Manitoba last year over the year before ?

A. I have not the figures, but I believe it was considerably more.

CANADIAN GRAPES IN ENGLAND.

By Mr. Smith (Wentworth):

Q. Were there any Canadian grapes on the market in England last year ?

A. No, sir.

Q. What is your opinion of the possibilities of that trade ?

A. That depends, first, on the growing of the proper varieties here, then on properly packing them, and on the possibility of educating the British to know how to eat our grapes.

Q. Does that seem to be possible or likely to be practicable ?

A. It will be somewhat slow. An Englishman expects to eat a grape as he does a plum, to bite into it and eat it all as a luscious fruit. My experience with our grapes is that they are only palatable if they are swallowed whole like a pill, and apparently the way to sell them will be to send a circular with every package telling how to eat them. A gentleman in Scotland some years ago sent a package of Canadian grapes to his son at college, telling him he did not know if he would like them, that it was an acquired taste. The young man in a couple of days sent for more, and said 'we have all acquired the taste.'

By the Chairman :

Q. A good many were sold in the West last season ?

A. Yes.

Q. Very considerable quantities were put on the market in Glasgow in years previous ?

A. Yes, and a mistake was made in not continuing with the varieties which sold well. While I would not recommend Concords, still it was found that Wilder and Vergennes sold well. They should have been continued.

By Mr. Richardson :

Q. Do grapes bring a high price in England ?

A. Hot-house grapes sell as high as 75 cents a pound.

Q. What other grapes do they have on the market outside the hot-house grapes and besides the white Malaga grapes of Spain; are there any cheaper grapes than that?

A. The Channel Island grapes sell at 4d. per lb.

Q. That is wholesale ?

A. Even retail.

Q. Then the wholesale price is about 5 cents ?

A. Five cents or six cents ; there is not a large margin for our grapes ; but we think it will pay.

QUALITY AND VARIATION IN PRICES.

Q. Would you advise our farmers to raise the Ben Davis apple ?

A. If I had them planted I should continue them, but I cannot say that I would advise the planting of Ben Davis apples.

Q. I attended the Farmers' Institute meeting some years ago in our locality, and there was a gentleman there, I cannot recollect his name, but he was from the western

part of the province I think, and he said he was planting ten or twenty acres, and he planted them with 'Ben Davis,' and advised anybody else to the same thing. What is your opinion ?

A. In view of my experience this year I think that would hardly be safe; except with a view of top grafting later on. It is only fair to say that it is selling very well owing to its long keeping quality. The only question is how long can we send increased quantities of them and still keep up the price. I think we should be cautious, at least, about planting Ben Davis.

By Mr. Smith (Wentworth) :

Q. Which market gives the best prices in regard to the choice fruit ? I understand there is a considerable difference, that while one market will give a fair price for medium grade another will give a better price, and the same with the choice fruit.

A. London will probably absorb the largest quantity of high priced fruit, but all the markets want some choice fruit.

Q. What about the medium quality; what is the best market for that ?

A. There are such variations in the different markets from time to time that it is hard to say. One day Glasgow will be selling a little cheaper than London, and the buyers will run up to Glasgow in order to buy, and another day London will be perhaps selling a little lower.

Q. You could arrive at that conclusion later by noticing the discrepancies in prices between first-class and second-class fruit from day to day ?

A. I cannot say as to that. It is a question of quality. Unless you could see some fruit offered here at a certain price and the same fruit offered elsewhere, you could hardly say which was the better market of the two.

Q. How long does it take to get from the ship's side to the market in London ? It is several miles, is it not ?

A. It is a matter of a couple of hours.

Q. Is it hauled by wagon ?

A. Yes.

Q. What are the streets paved with ? Cobble stones ?

A. The roads are very good. There is a very small stretch of granite setts, and a good deal of asphalt, and wood blocks, and one short stretch of macadam.

Q. Are they handled carefully ?

A. Very carefully in most cases, but there have been some complaints. On the whole the road from the docks to Covent Garden is exceedingly good.

Q. I suppose apples are sold by the barrel ?

A. The great majority of them. Some of them come up the Thames in lighters or barges directly to the warehouses.

Q. How long were you in London ?

A. I was there a number of times, a week or so at a time.

Q. You did not notice the difference in the condition of the fruit landed from different boats there ?

A. No, not being there continuously, so as to obtain a fair and reliable record for comparisons.

I had a word here as to work of the fruit division, but it is really a repetition of my evidence of last year on that point. There is the same work of inspection and holding education meetings still going on, as well as the holding of orchard meetings and addresses at farmers' institutes. There were 50 institute meetings in Ontario attended by the inspectors last year, 20 in Quebec and 20 in New Brunswick.

Having examined the preceding transcript of my evidence, I find it correct.

W. A. MacKINNON,

Clerk of Fruit Division, Department of Agriculture.

BREEDING PURE STOCK

COMMITTEE ROOM 34,
HOUSE OF COMMONS,
WEDNESDAY, April 8, 1903.

The Select Standing Committee on Agriculture and Colonization met this day, at 10 o'clock a.m., Mr. DOUGLAS, Chairman, presiding.

Mr. F. W. HODSON, Dominion Live Stock Commissioner, being called, submitted evidence, as follows :—

Mr. CHAIRMAN AND GENTLEMEN,—I consider it a very great honour to have been asked to appear before you. This is my first appearance before the Agricultural Committee. I feel that the work of this Committee is probably as important as, or perhaps more important than the work of any other Committee that convenes under the Canadian system.

Upon assuming office, in the autumn of 1899, I considered it my first duty to make a very careful examination of the live stock conditions in each of the Canadian provinces and territories. In 1901, two months were spent in Great Britain, making a study of the methods of live stock management prevailing there, of the markets for live stock and live stock products, and of the methods of conducting the large fairs. The information gained from these personal observations I propose to lay before you to-day.

AGRICULTURAL EXHIBITIONS.

Among the exhibitions attended were the Royal Agricultural Society's Show at Cardiff ; the Royal Counties' Show at Weymouth ; the Highland and Agricultural Society's Show at Inverness, and the Leicester County Show, as well as some others of less importance.

Many of the principal exhibitions held in Great Britain are itinerant and are held under canvas. Each of them follows a prescribed circuit, and thus the show is taken periodically to the people of each district. The stalls and pens are made of lumber which is cut as little as possible, but all the roofing is of canvas stretched as in the case of a tent. After the exhibition is over, the lumber is sold by auction. Usually there is more or less of a loss between the buying and the selling price, but this loss is sometimes very insignificant, and never heavy. The offices, the Board room, and a few of the smaller yet important buildings are made in sections, put together with screws and bolts, and are easily taken down and transported from point to point.

British exhibitions are purely agricultural and commercial ; there is no attempt made to provide attractions, what amusements there are being of a practical nature. The people take a very great interest in the exhibitions and the attendance is large. A pleasing feature is the number of ladies who attend. They come to see and to study conditions. British women, whether English, Scotch or Irish, are frequently very good judges of live stock and are very fond of animals. Most of them know a horse

and a dog very well, and many of them are expert judges of cattle, sheep and swine. About the stock pens and the judging rings may be seen at all times both young, middle-aged and old ladies, who freely criticise the qualities and merits of each animal as it comes before them. While it is true that the British women love animals and spend a certain portion of their time examining them and making themselves acquainted with them, they do not in any way lose their ladylike demeanour. There are no more accomplished, ladylike, or domestic women in the world than are to be found among the British people; in fact the rank and file are not only well educated but cultured.

It would be a very great advantage to Canadian agriculture and a stimulant to Canadian progress, if both the men and women of Canada, whether they reside in city, town or country, would take more interest in agriculture and make themselves more familiar with its needs and conditions.

HORSES IN GREAT BRITAIN—BREEDS AND GRADES.

The horses of Great Britain, whether heavy draught, medium, or light are generally of good quality. It is true there are some poor animals here and there, but they are not as common as in Canada and the United States. The reason for this is that great care is taken in breeding and feeding, and the animals are not so frequently overworked as they are in America.

In London, Glasgow and Liverpool a careful observer can form a pretty accurate estimate of the quality of the British horses and the method of caring for and working them. In London and Liverpool Shire horses are generally used for dray purposes, and a finer, stronger, sounder lot of heavy horses it is difficult to find. The dray horses of Britain as compared with those of Canada and the United States are generally larger and carry more flesh. In Glasgow those used are chiefly Clydesdales, and are not generally as large as those in Liverpool, but from a Canadian's point of view are of better quality, especially in the feet and legs. A remarkable feature of the dray horses in London and Liverpool is that a lame one or one with injured feet or legs is seldom seen. This condition will cause one to doubt whether the longish pastern and the hard flat bone are really as essential as Canadians and Scotchmen think they are. The Shire horses while larger than the Clydesdales are still good walkers, but only good walkers. They are not as active on their feet as the Clydesdales, and not as attractive 'movers', except at the walk.

The Clydes now in Edinburgh and Glasgow are a good class, but they are not as even in quality as the Shires found in the large English cities or boroughs. The next horse in size is the omnibus or tram horse. He should weigh from 1,250 to 1,500 pounds, must have good feet and legs, be active and a good walker, and capable of trotting off with a heavy load. These horses closely resemble the Clydesdale grades to be found all over Ontario, and are what are known here as general purpose horses. The next horse in point of size is the cab horse. He must be smaller and finer than the omnibus horse. A compact, active horse weighing about 1,100 pounds is the most suitable for this work. The next type of horse very generally used in British cities, towns and country places is a horse lighter than the cab horse and better bred. These animals are driven in two wheelers known as hansoms, a large number of which are used in every city, town and borough in Great Britain. Next come the cob, the pony and the polo pony.

There is a large and ever increasing demand for a first class dray horse. If he is strong and of good quality he is worth from £70 to £100. The general price paid for the omnibus horse is from £20 to £40; sometimes as much as £50 is paid. The cab horses are worth about £30, and the horses used in two wheelers from £30 to £45. A good pony will sell for from £25 to £50 according to his quality, and a good well broken polo pony will always bring a large figure, sometimes selling for from £80 to £100 and

upwards. There is room in England for all the horses Canada can breed and export, but in order to make this business profitable and establish a growing market for Canadian horses, nothing but first class specimens must be sent over. Heretofore, most of the horses sent to Great Britain from Canada have been used for omnibus horses, and a number of excellent horses may be found in London that were bred here, but there is little doubt that the most profitable horse for the majority of farmers in Canada to grow is a very heavy, well-bred, well-broken dray horse. Their motto in producing these horses should be—'The greatest quantity of the best quality.' Farmers residing east of Regina will not find any other type as profitable to breed, sell or export as the heavy horse, although a number may find it profitable to keep one good general purpose or driving mare, which may be bred to a large thoroughbred stallion, and thus produce a good cavalry or artillery horse. But it will be found that the average farmer will produce several light horses before he succeeds in breeding one that will bring him a remunerative price. A good many of the light horses in Great Britain have been produced by crossing general-purpose mares of good quality and size with strong, well-proportioned thoroughbreds.

Whatever sort is produced, let it be remembered that *quality, careful handling,* and *careful breaking* are the first essentials. Careful breeding is a very important consideration; proper feeding is also. A clever American said, not long ago : 'You may breed your animals ever so carefully, but unless they have the corn-crib cross, they will not amount to much.' I quite agree with this, yet I hope I shall be able to show you to-day that we want more than the corn-crib cross. The first important consideration in breeding horses is the sire. Care must be taken to select this animal from a good family, and he must be of the correct type as well. He and his ancestors must have a good pedigree. What is a good pedigree ? I will use Chart I. as an illustration.

For a pedigree to be really good, and a sire impressive, the generations should be alike in type, quality and breeding to the *seventh* generation at least.

I am speaking of horses now, but what I say in regard to horses, will apply also to cattle, sheep and swine. There is a great necessity for breeders to observe uniformity in the type of animals which they select as sires, also those which are included in the pedigree. The more uniformity in all the ancestors, both in breeding and in quality, the more impressive the sire will be. In stock-breeding a successful breeder pays a great deal of attention to this feature ; he cannot be successful unless he does. We very frequently see an excellent animal in every particular, that has been got by a good sire, but out of a very indifferent dam. A great many of this class are kept for sires in this country. What is greatly needed is what is called line breeding. The animals throughout the pedigree should be of the same breeding, quality and style. If an animal has had a bad sire, or a bad grand-sire, or dam or grand-dam, the peculiarities of these will crop out in the offspring, because the animal used as a sire is one of many and has only the influence of one, and against him is the influence of all the other animals in his ancestry. I would rather choose a poor animal with good breeding than a good animal with bad breeding, because in each case we have the influence of one animal against the whole ancestry, and each animal in the ancestry. To have a valuable sire and one whose produce will also breed well, all the animals shown in the chart must be of good quality, of the same type, and each must have a good pedigree, as explained in the case of this sire.

MR. WRIGHT.—I would like to illustrate that in this way. In the Ethiopian race, where they have been crossed by white people to the seventh generation, that seventh generation is almost sure to go back to the Ethiopian, and the same thing applies to horses and other live stock.

THE WITNESS.—We must not confound a long pedigree with a good pedigree. There are many animals with long pedigrees that are useless. Why ? Because their ancestors

have not been of uniformly good quality, nor have they been of the same type. The animals in their pedigree have been of various types. There are in Canada a large number of imported animals, many of them of very poor quality, and not bred to type; others look well, but their offspring is inferior, because their ancestors have been irregular in type, quality and breeding. If a man wishes to produce a herd of good cattle, or a stable of good horses, he must have them of uniform type, and in order to get them so, he must study and practise line breeding as far as type and quality go. So it is in breeding all classes of animals.

Another matter to which the British farmers pay a great deal of attention is feeding. They feed very much more correctly than our farmers do. To working horses the average Canadian farmer gives too much grain and not enough roots and ensilage. A great many horses in Canada are ruined because of this, as many by improper feeding as by underfeeding.

Another custom in this country which Englishmen do not follow, and which accounts for our horses being so much thinner in appearance, is that we overwork them. In the old country a farmer will use three horses to do the work for which we use two.

By Mr. Bell:

Q. Did you see any black horses?

A. Yes, there are a number of them; a great many of the Shires are black.

Q. Do you find the horses with good pasterns are standing the work best in London?

A. One of the most famous heavy horses in Britain to-day recently sold for a fabulous price, has short pasterns and his feet were not as large as Canadians and Scotchmen desire.

The Shire horse looks well when fleshy, but when he is thin he is often a lanky, rough-looking specimen. The mares we saw were much plainer than the geldings. The question is often asked why Ontario farmers use Clydesdales in preference to Shires. The Shires frequently sell better; they are the larger horses. These two families ought never to have been divided. It would have been better for the Clydesdales if they had been interbred with Shires, and better for the Shires had more Clydesdale blood been introduced into that family. But there are now two records and the two families are growing further apart. Many Canadian farmers are Scotch, and the people of Scotland and the north of England have had a great deal of influence here. They love the Clydesdale and he has been bred here apparently on that account. When the farmer lives close to market he can put 100 bushels of wheat on a dray and a heavy team will walk to market with it, returning in a comparatively short time, but those who live further from market, very often from 10 to 15 miles, desire a lighter team, weighing, say, 1,500 pounds apiece; these can take perhaps 50 bushels to market, but will return at a smart pace. Horses capable of doing this suit many better than those that walk back at three miles an hour. That is one reason why the Clydesdale has taken a better place in this country than the Shire, although the time has come, I think, when farmers living east of Regina will find it more profitable to breed heavier horses than heretofore. The best markets demand a heavy horse. The heavier horses the farmer can produce the more money he will receive when he is ready to sell. If he intends to wear his horses out the lighter ones may answer his purpose quite as well.

Mr. Robinson (Elgin):

Q. Are the lighter horses used in London hackneys?

A. No, they are not. Nearly all the lighter horses in London and Liverpool are produced from the use of a thoroughbred horse and grade mares.

By Mr. Bell:

Q. Are there not a lot of cast-off thoroughbreds in cabs?

APPENDIX No. 2

A. Yes, but they must be pony-built to wear well. We have thousands of small ponies on the western plains, some of which, if broken and educated, could be sold as ponies, others as polo ponies. There are probably between 25,000 and 30,000 of these little, now almost valueless, ponies roaming the plains and eating grass which cattle should be consuming. The existence of these small horses is a national loss in many ways. Lastly, we come to the polo pony. There is always a good demand in England for a good, well-broken polo pony. When I was going through the west I saw many of these ponies, some of which, if properly handled, would sell well, especially those on the Blood and Sarcee reserves.

By Mr. Boyd :

Q. They cost more to break in than you would get for them ?
A. I know of a few that have paid well.
Q. Made polo ponies of them ?
A. Yes.
Q. When you got through you had not much left ?
A. The question of getting rid of these Indian ponies is a serious one.

By Mr. Kidd :

Q. Are those referred to bronchos ?
A. No.
Q. I think it is a great mistake to allow these bronchos to come into Ontario ?
A. If grade Clydesdale mares of suitable quality are bred to a thoroughbred stallion of good substance, excellent horses are the result. Mr. Buttar, a celebrated breeder and farmer in Scotland, has been very successful in breeding hunters. He bred grade Clydesdale mares weighing from 1250 to 1400 lbs. to a strong pony-built thoroughbred horse. I know it is believed by many that the dam must have hunting blood, but Mr. Buttar is producing good hunters from grade Clydesdale dams and thoroughbred sires.

By Mr. Bell :

Q. Does he get them from the first cross ?
A. Yes.

By the Chairman :

Q. With a loss in weight ?
A. Yes.

By Mr. Bell :

Q. What other blood would there be in those grade Clydesdale mares ?
A. The same as in the grade Clyde found in Canada.

By Mr. Boyd :

Q. I never breed thoroughbred horses to mares of less than 1200 to 1400 lbs. of the type you describe. To breed a small mare to a thoroughbred is a waste of time.

By Mr. Bell :

Q. What would be the result of the cross of a Clydesdale horse on a thoroughbred mare ?
A. Often a long-legged weedy horse.
MR. BOYD.—Not always. I have 10 of them now. The cross has given good results with me.
Q. Would you advocate that cross generally ?

A. With weedy mares; we breed a good thoroughbred mare to a thoroughbred horse. Grade mares not heavier than 1200 lbs., or a weedy thoroughbred mare we breed to a Clydesdale or a big hackney.

CATTLE BREEDING IN GREAT BRITAIN.

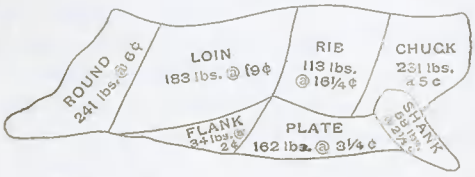
The rank and file of the British cattle are of better quality than the general run in Canada. They have been more carefully bred and more liberally fed for generations. There is less crossing and recrossing done there than here, and more care is taken in feeding and developing the cattle. The British farmer feeds his cattle as our best farmers do their pigs; that is, they feed in such a way as to produce a carcass showing a *large amount of lean meat in proportion to the fat.* When the animal is killed the flesh is found to be nicely marbled, and of excellent quality. Great Britain is deservedly celebrated for the quality of her beef, yet there is no reason why Canada cannot produce just as good beef as can be found in Great Britain. All we have to do is to use the same care and intelligence that we have developed during the last eight years in the breeding and feeding of hogs suitable for the production of Wiltshire bacon. Although the British cattle, both beef and dairy breeds, are better than are found generally here, Canadian herds of pure bred cattle are on the whole quite as good as, or better, than those found in Great Britain. We have a large number of breeders of pure bred cattle who understand their business as well as any men to be found in Great Britain, and better than a great majority of British breeders of pure bred live stock. In a great many instances the British breeder pays less attention to the quality of the dam and the sire, the grand dam and the grand sire of his breeding bull, than do the Canadian breeders. It is true there are men in Great Britain, such as Messrs. Duthie, Marr, Willis and a few others, who understand and practise just as good and careful methods as do our best men. But these are exceptions, and as a rule it is safer for the Canadian farmer to buy his breeding bulls from reliable Canadian breeders than it is for him to import his breeding males from Great Britain. Where a farmer buys from a Canadian breeder he can see the dam and sire, frequently the grand-dam and grand-sire and female ancestors for several generations of the animal he wishes to buy, but when ordered from Great Britain he simply has to take what is sent him and depend on another man's judgment, and that other man is chiefly interested in sending him an animal that will look well when it gets here. We have a few importers who carefully select the animals they import, and from these it is always safe to buy, but even in such cases the Canadian farmers should buy and pay more money for the animals these gentlemen breed than for those they import. While the men referred to carefully select and pay very long prices for what they buy, there are many others who buy in Great Britain and import poor stock, inferior both in quality and breeding, and abuse the privileges given importers.

Canadian fat cattle sent to the British market compare unfavourably with the American or English product. Generally ours sell at one cent per pound less than the American cattle. It is not that our beasts are of worse quality; they are not as well finished. The English beef is rich, juicy, well marbled and of excellent quality. English cattle are well fed from birth; many of ours are starved for some time. Afterwards they are not fed well enough to make first class beef before being put on the market. This is not because Canada cannot produce just as good beef as Great Britain or the United States. We must exercise the same care in feeding our cattle that we exercise in feeding our swine in order to produce meat of the right quality.

CHARACTERISTICS OF A PRIME BEEF ANIMAL.

We ought to do everything we can to encourage those men who breed and sell good sires, because without them stock raising could not be made profitable. We must have

good feeding and good breeding combined. The question arises, what is a good beef animal ? The one that will produce a large amount of valuable meat for the food consumed.



Wholesale dealers' method of cutting beef.

This chart shows where the most valuable cuts are. The most valuable carcass is the one containing the largest amount of meat, where the cuts are most costly.

By Mr. Bell :

Q. Was the beef in this case produced as cheaply ?
A. In this experiment, yes.

SHEEP BREEDING BY SELECTION.

Great Britain is a sheep growing country par excellence. The flocks are large and very good, and exceedingly well managed. The greatest care is exercised regarding the quality of the breeding males. The ewe flocks are large and of uniformly good quality, but even the British farmer could improve his methods by exercising more care in selecting his rams. The quality of those he now buys is good, but not always does he know what sort of ewe was the dam of the ram he bought. This is a very important feature. The usual custom with the sheep farmer is to go carefully over his flocks each year, and reject and send to the butcher all the aged ewes, yearling ewes, ewe lambs and rams that are not of the desired quality. This culling process is very carefully carried out.

Buyers are not generally allowed to select from the breeding flock of any of the well established breeders. The best of the stock is reserved for their own use, they sell the next best for breeding purposes, and the third grade goes to the butcher. This careful selection and grading are what have established and maintained the supremacy of the English flocks. British farmers are not breeding any better sheep than we are capable of, if the same attention is devoted to the industry. In Britain grading has been so carefully done that their sheep are appreciated throughout the world. They are bought by all countries to use for improving the native stock. It is largely because of this very careful culling that has been going on continuously for a century or more that they have attained this position. In Canada we cull on a very different principle. Many of the pure bred flocks in Canada are annually culled by the Americans who come to buy the best to improve their flocks, and leave to our breeders the second and third class animals.

By the Chairman:

Q. That is a big mistake ?

A. We cannot have good sheep unless we adopt a proper system, but Canada can produce as good cattle and sheep as are found in the old country if we but follow the same system of culling and feeding year after year, and are careful in the selection of sires and always continue with the same breed. Thus, if a farmer starts with Southdown sheep he should keep on continuously with the same breed and type of the breed; if he does so he is bound to succeed. We can in Canada produce as good sheep as the

old country. A few men who have been breeding Leicesters year after year have attained great success. There was not in the past the same demand for them as for some other breeds, and the result is that the breeders have yearly kept the best ewe lambs, and we find that when the British Leicesters come here, even prize winners at the Royal exhibition, they are easily beaten by sheep bred in Canada. Our Leicesters are better than the English. In Shropshires we have probably the best flock in the world. I have seen Mansell's flock, which was said to be the best, but it is not as good as we have in Canada. We have probably some of the best Southdown flocks in the world to-day. From this we learn that Canada can produce good sheep if we follow the proper system.

BREEDING HOGS FOR DEFINITE PURPOSES.

Canadian, and in a large measure American, breeders have been taught to look upon Britain as the producer of the best bacon hog in the world, if not the best hog for any purpose, and it was a great disappointment to find that the quality of British pigs, as a general thing, is much inferior to that of the pigs in Canada. The average Canadian farmer knows more about pig breeding and produces better pigs than the average British farmer. Here and there are to be found sections that are producing very good bacon pigs, and here and there are pure bred herds of excellent quality, but the amount of first-class bacon produced in England is small in comparison with what it might be if more attention were paid to the type of hog required. But if the Englishman is anything, he is strongly prejudiced in favour of what he produces himself, and although some British bacon is inferior to that produced in this country, still if he knows it is English he likes it better than anything he buys elsewhere.

The principal breeds are what we call Yorkshires, known there as Large Whites, the Middle Whites and the Small Whites. Among the first are found a great many good pigs. The Middle Whites are not a desirable breed. They are too thick and too fat. The Small Whites are what we call Suffolks. Very few of them are to be found and they are now bred only by gentlemen who want to breed something unlike that kept by the average farmer. The English-bred Berkshires may be put in the same class as the Middle Whites. They too are kept by gentlemen farmers, and although better pigs than the Middle Whites, the British type of Berkshires is too thick and too fat to be of service in Canada. The Berkshires found in Canada are better for our purpose than anything seen at the shows in Great Britain. The Canadian breeder should use every effort to improve his Berkshires. They are an excellent breed for crossing purposes, but they must not be allowed to become too thick. Next in numbers to the Yorkshire comes the Tamworth, and a very good pig he is. The Canadian Tamworth herds as a rule are superior to those bred in Great Britain. There is another breed of pigs in some sections of England that is now attracting attention. These are known as the Large Blacks, and are to be found in Cornwall, Essex, Kent and Cumberland. The specimens exhibited at the fairs resembled the Yorkshires, except in colour, that were first imported to Canada, but are somewhat thicker, and even coarser than they were. They are said to be excellent grazers, and some of the pork-packing establishments claim that they are just what they want. In colour, they are entirely black. Their ears are large and drooping. They ought to have many good qualities, for at the present time they are perhaps the ugliest pigs on earth.

By Mr. Robinson (Elgin) :

Q. What are the Large Whites ?

A. What we call Yorkshires.

Q. Are the Large Blacks as large as the Yorkshires ? Where are they found ? What is their peculiarity ?

A. They are found principally in Cornwall, Essex, Kent and Cumberland, and are practically unknown in this country. They are large, coarse, black pigs with

large drooping ears. Some British pork packers speak well of them. They are said to be very hardy, good grazers, and to produce and rear large litters. In size they compare favourably with the Yorkshires. There are a few specimens at the Central Experimental Farm, Ottawa. Experience there has not led us to consider them better than the Tamworths or Yorkshires.

Canadian hams and bacon are attracting a great deal of attention in Great Britain, and form a large section of the bacon that is imported. Denmark's No. 1 quality is one and one-half times the total sent from Canada. However, taking the quantity into consideration, Canada ranks high in quality in the British market. A little of the Irish sells for a higher price than the average Canadian, or in fact higher than any of the Canadian, but the amount of good stuff sent from Ireland is small in comparison with that which comes from Canada.

The questions will naturally arise : 'How can we increase our trade with the mother country?' and 'How can we make that trade more profitable?' These questions may be answered in a few words : 'Send only the best goods to Great Britain, and put them before the consumers in perfect condition and in an attractive manner.' The farmer sometimes forgets that he is greatly interested in this, and therefore leaves all the details to the exporter and the middleman. He should see that these men do their work well. If not he will be the ultimate loser.

We must finish our fat cattle better than we are finishing them at present. They are not as good as either the English or the United States bullocks. Our exported sheep are very inferior to both English and United States stock. Our horses have not as good a name in the English market as they should have. Our bacon, our cheese and our poultry occupy a very enviable position.

Every time we send a case of good goods to Great Britain we create a demand for more. Every time we send a bad bullock, a bad sheep, or a bad case of any sort we injure our trade.

The reason that pigs are so profitable in Canada to-day is that the Canadian bacon trade has been well and wisely handled.

A very noticeable feature in the management of British stock is the fact that large numbers of the same breed are to be found together. In certain districts of Scotland we find whole counties, in fact whole districts, given up to Ayrshires ; in other districts we find the Highland cattle prevailing, in others the Galloways. In sheep we find the Black-faced Mountain sheep in one district ; the Cheviots and what are known as the cross-breds in another ; a large territory in the north of England and in the south of Scotland is covered by Border Leicesters. It would be difficult to find any other breed of sheep, except here and there a flock of Wensleydales, which are another type of Leicesters, and a very good sort. The Herefords, Devons, Welsh, Kerries, Jerseys and Guernseys have each their respective districts, and so also in the case of pigs. A breed is kept in a district best suited to its characteristics. This is a feature that has not been considered to any extent by the Canadian farmer, but it is an important point, and one that sooner or later must receive attention.

By Mr. Kidd :

Q. Is there any dressed meat going from Canada ?

A. Yes, but it has not been profitable to date. I hope Canadians will be able to establish abattoirs in time which will enable Canada to enter on this trade.

Another valuable feature in old country practice is that families continue in the one line of breeding for an indefinite time. It is not unusual to find a family which has been engaged in raising one breed of cattle or sheep for generations on the same farm. Take the case of the Mansells, who have been breeding Shropshire sheep on the one farm for 70 years. No wonder they had the best flock of Shropshires in the world. It is not so here. You will often find a farmer who started perhaps with Cotswolds ; then when he found the market for them off, he bought Leicesters ; then he turned to Shropshires ; going from one to another in the process of time. These

men do harm in their district, because they unsettle the practice of the district, but the man who goes on year after year in the same line is bound to do great good to his neighbours, as well as proving successful himself. There are Canadian examples, one I might mention, that of a man who has one of the best herds of Shorthorns bred any where. His father was a breeder, breeding along certain lines. The present owner went on improving the quality of his herd along similar lines. The grandson is now following the same line, spending money and time to develop this Shorthorn herd.

By Mr. Wright :

Q. How can the farmers of this country be taught to follow the system of breeding you have outlined ?

A. Our educational work is gradually growing, and I think we will accomplish much through the Farmers' Institute system.

After making myself as familiar as possible with the requirements of Canadian agriculture, particularly as regards the live stock industry, I decided to undertake six special lines of work.

1. The establishment of farmers' institute systems in each province where such were not already in operation and the improvement of such systems as already existed.
2. The improvement of agricultural societies and exhibitions.
3. The establishment of provincial auction sales of live stock.
4. The extension of interprovincial trade in live stock.
5. The establishment of provincial live stock associations and provincial educational shows.
6. The publication of press bulletins on live stock and kindred subjects.

APPENDIX No. 2

COMMITTEE ROOM 62,
HOUSE OF COMMONS,
FRIDAY, April 24, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock a.m., Mr. Douglas, Chairman, presiding.

Mr. F. W. Hodson, Live Stock Commissioner, was present by request of the Committee, and continued his statement as follows:—

Mr. Chairman and gentlemen, the subjects that I am to speak on to-day are: the improvement of agricultural associations, the founding and work of farmers' institutes, provincial auction sales and educational fairs, and interprovincial trade. Each of these would occupy considerable time if it were available, but I shall speak briefly of each, and try to bring to your notice some facts of importance.

IMPROVEMENT OF AGRICULTURAL ASSOCIATIONS.

In several of the Canadian provinces agricultural societies, with the exception of a few, have been doing no work outside of the holding of an annual show. These societies and farmers' clubs in Canada are receiving from various sources nearly $1,000,000 a year. Let us consider for a moment what, in the mind of the founders, was the object of these societies, as set forth by some of the provinces:—

1. Importing and otherwise procuring seeds, plants and animals of new and valuable kinds.

2. Offering prizes for essays on questions of scientific inquiry relating to agriculture, horticulture, manufacture and the useful arts.

3. Carrying on experiments in the growing of crops, the feeding of stock or other branch of agriculture, or by testing any system of farming through arrangements with one or more of the farmers of the municipality in which the society is organized.

4. Awarding premiums for excellence in the raising or introduction of stock, for the invention or improvement of agricultural or horticultural implements and machinery, for the production of grain and of all kinds of vegetables, plants, flowers and fruits and generally for excellence in any agricultural or horticultural production or operation, article of manufacture or work of art.

Clause 1 has received little or no attention in Ontario and westward, but societies in the eastern provinces have purchased male animals for the use of their members. This is an excellent work, and has given first rate results in Great Britain, especially in Ireland, but in order to procure desirable results the members of the society should determine what breed, whether of horses, cattle, sheep or swine, is best suited to the district, and then males should be bought of that breed only, year after year. For instance, the society should not buy a Shorthorn bull one year, an Ayrshire bull the next year, a Jersey bull the next year, and so on, but if they determine that Shorthorns are best suited to their district and the needs of their people, they should commence by buying a Shorthorn bull and continue to buy Shorthorn bulls year after year, and no others. It is by following out this course that Britain has become famous as the home of the best herds in the world. If we were to go into the County of Shropshire we would know that we were in Shropshire, because we would find nothing but Shropshire sheep there; if we were to go into Devonshire, we would know that we were in that county because all the cattle we would see would be Devon cattle. This con-

tinuance in one line of breeding is the only method that can make a district successful in stock breeding. The society, or the farmer who mixes the various breeds, whether of horses, cattle, sheep or swine, will never own a good herd, and will never produce animals of individual excellence, except by accident. The Institute speakers, who have been sent out from the department, have informed me that a number of the societies have done more harm than good to their district by buying males, first of one breed and then of another. The result has been a mixture that is practically valueless to the people.

Funds spent as above described are worse than lost.

By Mr. Wilson :

Q. What do you mean by public expenditure; don't they subscribe the money that buys the cattle ?

A. Only in part. They use their government grants.

Q. That makes a difference. Can you give us any idea of the relative amounts so spent in the various provinces ?

A. In Ontario upwards of $80,000 a year is given directly by the Legislature, and the balance, over $300,000, is collected from the people or subscribed by the counties themselves. A like proportion is obtained in a similar way in each of the other provinces.

By Mr. Ross (Victoria):

Q. Subscribed by the societies ?

A. Subscribed by the societies and by the counties, or taken in entry fees and gate receipts.

Clause 2 is very important, but one which has not been put into general operation. I do not know of more than one or two agricultural associations in Canada that have followed this plan. The old Agricultural and Arts Board of Toronto did so for a number of years, and gathered together a great deal of useful information. The reports of that body were much sought after by farmers, Canadian as well as American, but when the Board went out of existence that work ceased. By combining the farmers' institute work with the agricultural associations' work, as we are trying to do, we hope that this work will again be taken up. There are in every district a number of clever men who take an interest in agriculture, though they may not be agriculturists themselves, but are scientific men who at present pay very little attention to the work of the agricultural associations. By putting clause 2 in force we could arouse the interest of these men as well as that of others of other classes that now take but little or no part in this work, and we could gain a great deal of useful information on agriculture and kindred subjects from practical as well as scientific men.

Clause 3 is important and has been introduced into Ontario during the past year, namely, carrying on of experiments in the growing of crops, the feeding of stock, or other branch of agriculture, or by testing any system of farming through arrangements with one or more of the farmers of the municipality in which the society is organized. That is on the lines of the county council system of Great Britain that has given fairly good results there, and it is thought would give exceedingly good results in this country. We know that the experimental stations have done useful work; through them we have been enabled to benefit by the experience of other countries and to learn what varieties of grain, grass, &c., are most suitable for different parts of our own country. Through these stations have been imported and distributed varieties of grain from other countries ; some of these are much more profitable than varieties previously known here. The experiments in the feeding of stock have been very valuable. We have at Guelph one of the largest and best conducted experiment stations in the world. The work that has been carried on at the Central Experimental Farm, Ottawa, has been performed very carefully. At Agassiz, Indian Head, Brandon and Nappan excellent work is also being done. Canada is very large, and it naturally

follows that what has been found to give good results in the Ottawa district does not necessarily give good results in other districts. Varieties that do well in the Toronto district are not the same that do well here. Experience in different districts varies greatly in this respect ; so much is this the case that in the public interest smaller stations should be planted here and there all over the country, so that work may be done for the different counties.

By Mr. Wright :

Q. Experimental stations ?

A. Experimental stations, or 'illustration' stations. They are the same whether you call them illustration stations or experimental stations. Their purpose is to carry on experiments in the growing of crops, the feeding of stock and the testing of systems of farming. Prof. Robertson suggested that this work be commenced in Canada some years ago, and although his plan was not carried out, it has been the means of bringing before the people of Canada this plan. It caused people to think and study out how the desired result could best be brought about. All over Canada, in almost every county, there are agricultural associations, and the suggestion was made : 'Why not put these experimental plots on the grounds of the agricultural associations ? Why not employ a market gardener or some one capable to take care of these plots ?'

By Mr. Wilson :

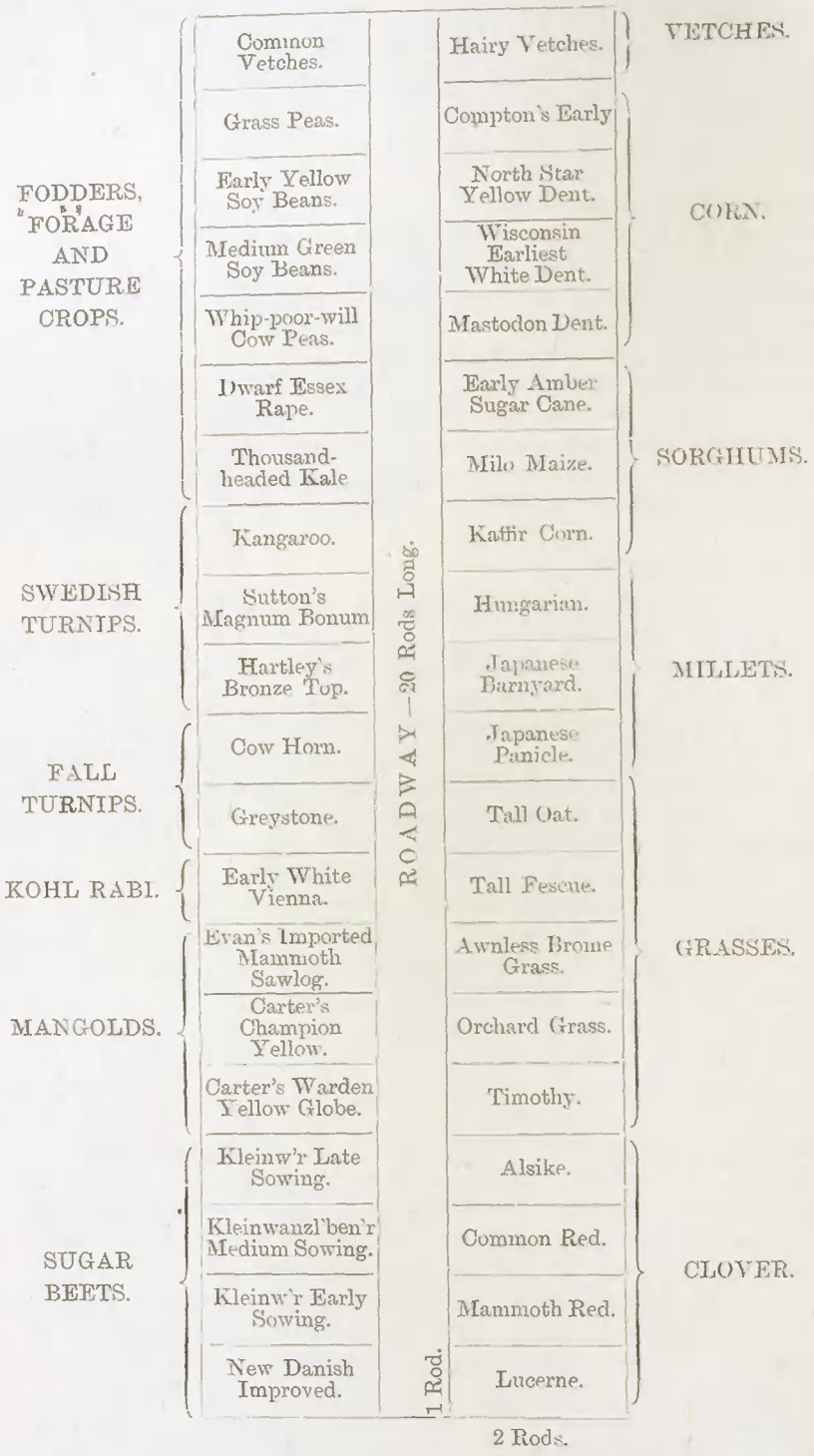
Q. Some fair grounds are not fit for that sort of work ?

A. Nearly all of them are.

Q. The agricultural association ground in our town is not.

A. We find that most of them can be adapted to the purpose. We chose one association at Whitby and tried the experiment on their grounds. They had a very poor, sandy piece of ground; but a line of experiments was conducted last year which would be useful in that county. Mr. Ross (South Ontario) knows that the land is one of the poorest pieces of ground in South Ontario, and he also knows that these plots gave excellent results.

PLAN OF ILLUSTRATION PLOTS AT WHITBY FAIR.



This chart gives a plan of the experimental plots on the Whitby Fair Grounds. The plots occupied an area 20 rods long and about 10 rods wide. There was a path down each side, and a broad path down the centre. We made arrangements to have a wire fence put around the plots. This is most necessary in order to protect them, but

all associations can do this very easily because the wire fence men are always anxious to exhibit their fences, and we let them do so in this way. We had strong iron gates put at each end. This plot was left to the care of a market gardener in the district, who did the work exceedingly well. I will speak of the results of our experiments in a few of these plots. It is a dry district, so that from the first of August until the middle of September there is frequently not very much grass.

By Mr. Ross (Ontario):

Q. You do not mean to say that applies to the whole of South Ontario south of the watershed ?

A. Yes.

MR. WRIGHT.—I would like to say that the town of Renfrew has been very strongly impressed with the value of that kind of work, and that they are going to have illustration plots on their grounds this year.

By Mr. Ross (Ontario) :

Q. You know that that particular plot is probably one of the worst spots in the whole county; your remarks do not refer to the whole county.

A. There are some grand farms in Ontario county. It just happened that the ground chosen for the agricultural fair is very poor, but South Ontario is a very rich county, although we have too much dry weather. To return to the plots, we have found that common vetches will yield about 4 tons of fodder per acre, taking one year with another over a period of five or six years.

By Mr. Stewart:

Q. How many acres are there in the piece ?

A. Not many acres; it is 20 rods long and 10 rods wide, and the plots are a rod wide and two rods long. The yields I am quoting are the comparative yields from the whole of Ontario. The hairy vetch has never been seen in the county of Ontario before except on one farm, where it was tested for some time, and we found that where the common vetch yielded 5 tons to the acres, this yielded over 10 tons per acre of just as good fodder. The farmers saw the hairy vetch growing for the first time and were able to judge of its value. There is another point of value. While the common vetch is entirely gone by the 15th of August this was quite green on the 20th of November, as green as on the 1st of June, full of flowers and growing rapidly.

By Mr. Robinson (Elgin):

Q. Where is that imported from ?

A. From France and Germany. It came originally from Western Asia. The seed can be grown in Ontario, I am glad to say. At the present time the seed is worth about $7.00 per bushel.

By Mr. Broder :

Q. How much do you have to sow to the acre ?

A. A bushel. These plots attracted a great deal of attention, and a great many people came to see them. The next plant, the grass pea, is valuable only to a limited area.

By Mr. McGowan :

Q. How is this sown ?

A. The seeds were drilled as an ordinary crop.

By Mr. Wilmot :

Q. How was the ground fertilized ?

A. As for a general farm crop. When we took it the plot was as poor a spot as one could find, but we cultivated it, fertilized it, and put it in as good condition as we could.

By. Mr. Broder :

Q. Do you ever sow broadcast?

A. Yes, but prefer to use a drill.

The grass pea has been advertised extensively and sold to the people everywhere. It may be grown in the districts where the ' pea weevil ' is destructive; the weevil does not affect it. I do not think it would be useful in New Brunswick, Nova Scotia, or Prince Edward Island, nor in Western Canada ; it is too slow in maturing. We found, however, that it gave a very heavy yield of green fodder, and that it may be cured for hay. It was known to only a few in South Ontario ; the farmers saw it growing on this plot and could determine whether to sow it or not.

The next is the Soy Bean. The Early Yellow and the Medium Green were the kinds grown. This plant has not been grown previously in South Ontario except on one or two farms. In some of the States it has given good results. The Early Yellow Soy Bean has produced a crop of grain at a cost of $10 per ton; it is worth $30 a ton for feed. It is a very rapid flesh former, nearly equal to cotton seed meal or linseed meal. After the bean ripens the leaves fall off and the straw is of very little value. The Medium Green Soy Bean will not ripen in many portions of Ontario except in the peach belt, but it is very valuable for soiling. It is an excellent green feed for pigs and dairy cows.

The next, the Whip-poor-Will Cow Pea is of no use in Ontario except in the peach belt, but there it gives good results as a crop for ploughing in. There were several varieties of Swedish turnips sown side by side for comparison, also the Greystone and the Cow Horn, fall turnips. The latter has been widely advertised, but the yield was about one-half that of the Greystone turnips. The farmers could see that this highly advertised variety is not of much value.

The value of these plots was that the farmers could see and compare varieties. It was the most attractive portion of the exhibition and cost the association less than $180. As an attraction it was cheap, and as a means of education it was the best yet introduced into South Ontario. In corn, grass and clover growing valuable lessons were taught. Some varieties proved much more valuable to the district than others ; some of these were seen for the first time by many of the farmers. The chart shows the varieties of corn and grass, &c., tested.

MR. ROSS (Ontario).—I would like to add that the trial plots were among the most attractive things at the exhibition last year. The people were extremely interested in the addresses of the professors, who explained the nature of different plants that were growing there, and some very interesting lectures were given. All day the main roadway was filled with people watching the different plots and studying them, and they were much interested. I would say from the experience of Whitby last year that every agricultural exhibition should have illustration plots.

AWARDING PREMIUMS AT EXHIBITIONS.

THE WITNESS.—The next clause governing our agricultural associations is one known to most of our people, and the only one that our agricultural associations carry out. It is the awarding of premiums for excellence in the raising or introduction of stock, for the invention or improvement of agricultural or horticultural implements and machinery, for the production of grain and of all kinds of vegetables, plants, flowers and fruits, and generally for excellence in any agricultural or horticultural production or opera-

tion, article of manufacture or work of art; in short, a competitive exhibition. This work is useful; it has done good in the past; it has stimulated a good many people to greater effort, but during the last few years the judging has been very bad. The whole value of competitive exhibitions depends on the judges. Profiting by the experience of Mr. C. W. Peterson, Deputy Commissioner of Agriculture for the North-west Territories, this department undertook in 1901 to inaugurate an improvement in the method of conducting county and township fairs by sending expert judges for the live stock classes, who explained to the spectators their reasons for placing the awards as they did. In this way the judging is made an educational feature, instead of being merely an allotment of premiums by men who are often incompetent or biassed in their judgment. The fairs were arranged in circuits so that the judges were able to get from one to another with as little expenditure as possible of time and money. This new plan proved so eminently satisfactory at the county fairs in the Ottawa Valley, in the North-west Territories and in British Columbia, that a great extension of the movement has taken place, and during 1902 judges were sent by the department to a number of leading fairs in Quebec, the Maritime Provinces, the North-west Territories, and to practically all the fairs in British Columbia. The Ontario agricultural societies have been placed under the control of a superintendent, who last fall arranged nearly 60 fairs in convenient circuits, sent them expert judges and assisted the directors in drafting up-to-date prize lists. If this plan be adopted, one or more judges should be sent to each division to judge horses, one or more to judge beef cattle and sheep, one or more to judge dairy cattle and pigs, one to judge poultry, one to judge fruit ; some one on each deputation should be able to judge roots and vegetables. In each class a good local man should be added.

IMPORTANCE OF CORRECT JUDGING AT FAIRS.

By Mr. Maclaren (Perth) :

Q. Do you believe in having one judge or three ?

A. One is best, and he should be sent over a circuit, as in the case of institute speakers. Ontario is divided into twelve circuits. As far as possible in arranging these, the counties whose products are alike should be grouped together ; men best fitted to judge in a division can then be chosen. Choose a trained man for this work and ask the local agricultural association to select a suitable local man to act with him. Thus we have a local man in training, and by this means additional judges will be obtained. The work of each judge should be carefully and impartially reported to the superintendent by the officers of each association on blanks provided for the purpose, within ten days of the close of each exhibition. These reports should be strictly confidential, and by them the work of each judge can be closely followed. Suitable men can be continued year by year ; unsuitable or dishonest men can and will be at once detected and discharged. Suitable men can be employed as judges for several months each year and properly paid for their services, as institute lecturers are now. Competent judges residing in Manitoba could be brought to Ontario, Ontario men could be sent to Manitoba. Such an exchange could take place throughout Canada and would serve many good purposes. This course would encourage good practical farmers to fit themselves to act as expert judges. As it is now, it is a hardship and a loss to a suitable man to act as judge. The employment of incompetent judges is a great injustice to exhibitors. It is a serious matter for the farmer to spend money, time and feed in fitting a stud, herd or flock, and at the end of six or eight months have the prizes placed by a novice, or worse still by a knave some crafty competitor has had appointed. At the smaller shows the novice is frequently appointed ; at the larger shows the knave too often appears.

Q. Don't you think for large fairs it would be well to have more ?

A. One good judge is better than more.

Q. Many places prefer to have three ?

A. There is a chance to shift the responsibility in that case.

By Mr. McGowan :

Q. To some fairs you have sent as many as five judges.

A. Yes, one to act in each of five departments. In Quebec, Nova Scotia, Prince Edward Island, North-west Territories and British Columbia judges have been sent. So many are being asked for now that the demand cannot be supplied under present conditions, but arrangements may be completed in the near future to overcome this difficulty.

By Mr. Maclaren (Perth) :

Q. The reason I am asking about three judges is that in the Dairy Department of the Toronto Fair, for instance, the exhibitors of butter and cheese are asking for a judge from the west, one from the east, and also one from the centre, promising that with these three judges we will get a much larger exhibit of dairy products from all parts of the province. That is the reason why I am asking whether you would recommend three judges, and if you think it advisable for the sake of getting a large exhibit to let them know that we are going to have three judges ?

A. We do not send judges to the larger fairs, such as Toronto, Ottawa, Winnipeg and London, but it may require three men to do the judging in a class at Toronto, where one man is enough to judge a class at a county fair.

By Mr. Clancy :

Q. Before proceeding further, I would like to ask a question : Do I understand that these judges are to be under the control of the government ? Are they to be paid by the department, or by the local societies ? Of course they will have to be paid in some way, and I would just like to know where the central authority is to be ?

A. Expert judges are controlled by the department that sends them out. The local governments are taking this work up, and I notice that the province of Ontario has this year voted $3,000 to pay judges, but heretofore we have sent these men out to the various provinces as an experiment, and they were paid out of the funds granted my department. Now that the demands are so great, some plan must be evolved whereby the local people will bear at least a portion of the cost of the work. Under the old system of judging, the awarding of prizes for fancy points prevailed to a very large extent. For instance, in the Jersey class if a cow had a black nose, tongue and switch, and was of solid colour, she stood a good chance to win in many rings. If she had these points a great many judges forgot that a dairy cow needed to have an udder. The Jerseys have been very much injured in this manner. Judges have been awarding prizes to Ayrshire cattle with horns that must be curved just so, the udder must be square and have a flat sole as they say, but that gives a very short teat. The result has been that the Ayrshire cattle have been driven out of herds in Ontario, simply because this system has been followed, and prizes given to Ayrshire cows that were of a certain type whether they were suitable dairy cows or not. This is entirely wrong. When judging, a judge should give the prizes to the best dairy cows in a class, irrespective of these fancy points. Last season I saw prizes given to cows with teats not more than an inch and a half long, large udders and plenty of milk, but they were useless in a commercial herd; milking of such is too slow and difficult. Such a system of judging is a very great disadvantage to the country. This difficulty must be overcome, or the million dollars annually spent by our agricultural associations will do more harm than good to the agricultural industry.

By Mr. Blain :

Q. Do you send the same judges to each of a circuit of fairs ?

APPENDIX No. 2

A. Imagine a circuit of twenty fairs; start with one set of judges, and let them attend every other fair; another set of judges should alternate with them. In that way a division having about twenty fairs can be conducted, and the animals going from one fair to the next will have different judges.

Q. I understand that there is some complaint on that point, that a set of judges, go to a certain number of fairs, at these fairs they meet the same cattle, exhibited by the same people. If they have met a fine herd of cattle from one breeder, and passed their judgment upon those cattle at a certain fair, and given a first prize to a certain animal, and then they meet that same herd of cattle at four or five other fairs, the result of the judging is the same all the time. There was some complaint on that point I know.

A. Yes, but nothing to speak of. There is only one fair that I know of that has made any complaint. There are always fresh animals at the different exhibitions from different herds, but to overcome any difficulty on the score you speak of the divisions have been changed to some extent. It is very important that suitable men be chosen as judges; on this depends the whole educational value of the system. A man may carefully prepare a herd of animals at great expense of time and money, and bring them to an exhibition, and have them judged by a novice or an incompetent or prejudiced man. We are trying to overcome this condition, and also to overcome the still worse practice of having the animals judged from their fancy points alone. It would be better to withdraw the grants altogether than to go on doing the work as it has been done in the past. I do not say this applies to all fairs, but it does apply to seventy-five out of every hundred.

By Mr. Gilmour :

Q. Before you leave that portion of your address I would like to ask about the judging of animals. You said that judges would be sent out with the idea of getting uniformity, I suppose by the same method. Who is to decide the relative value of the various points ?

A. The old system of appointing judges and making awards has in many cases lost all educational value. Many of us have lost sight of the fact that the public funds given to the agricultural associations are granted for educational purposes. Steps have been taken by the Dominion and Ontario Departments of Agriculture to hold, at given periods and places in Canada, short courses where men, already good judges, may attend for a few weeks once or twice a year and hear lectures and be given instruction in judging by the best known live stock experts in each separate class or breed of stock. Six of these courses have been held at the Ontario Agricultural College, with the most gratifying success, and two courses in Manitoba. Each person regularly employed as a judge must attend at least one of these courses each year. At an early date an authorized standard of excellence of each breed of live stock will be issued. All awards should be based on this standard ; as it is now, each judge places prizes according to his own ideas only. The standard of excellence when completed will have the approval of the board of directors and membership of the societies representing each of the respective breeds. As necessity demands, each association can amend or alter the standard for the breed which it represents, when a new standard for it will be issued. This plan will effect a great improvement both in judging and in the types of animals found throughout Canada.

Q. My question is, who is to have the final selection of these merits that must be valued by points ?

A. The judge must judge according to the standard.

Q. Who sets the standard ?

A. The breeders of each kind of animal. They themselves set the relative value of the different parts ; they have already done so.

Q. But I am asking you how you are going to do that ?

A. We draft a standard of excellence and submit it, say to the Shorthorn breeders, and ask each to assist. These replies are sent to a committee of the Shorthorn Breeders' Association, selected by the association, and these men formulate a standard. We have had a number of short courses in stock judging, one at Winnipeg, one at Brandon and six at Guelph ; now there is a demand for the same thing in the lower provinces, the North-west Territories and British Columbia.

Q. What are we to understand by this $1,000,000 you speak of ?

A. That there is about a million dollars received every year by the agricultural associations and farmers' clubs in Canada, and expended by the officers. I have spoken altogether on the educational features of the fair ; many associations demand amusements.

By Mr. Sproule :

Q. Before you pass from that, is it the intention to carry out this plan that each association must comply with regulations or otherwise lose the grant ?

A. No, it is as they please. At present each association may comply or not. Some of the provincial departments will probably take some positive action in the future. It is said that a great many people go to the exhibitions to be amused. I say without fear of contradiction, that many of the so-called amusements that have been introduced at county fairs have never paid the associations. Consider the case of Guelph fair in Wellington county, one of the richest counties in Ontario, including a city of 10,000 people; that should have a good fair. They spent in 1901, $500 for attractions ; the first day, when the animals were shown, and when it was largely educational, they had a very good attendance ; the second day they paid $195 for attractions and for horse races, and they took in gate receipts $135 ; the following days were no better. I would have attractions, but I would have them different from what they have been. I would have a horse ring, but one conducted on different lines from those along which it has been conducted in the past. Instead of racing, I would have hurdle and water jumping by farmers' sons, and instead of jockeying, I would teach riding and driving such as is seen at the horse shows in Toronto and New York.

In this connection, I think that a gymkhana would prove a very good amusement feature, and at the same time would interest our boys in the saddle horse, and give them a great deal of experience in riding. Let me quote a few lines from a letter received from Mr. S. B. Fuller, the well-known horseman of Woodstock, Ont. He writes :

'I quite agree with you that riding on horseback should be encouraged in this country in every possible way, and that the gymkhana would much assist towards this object. It is a rare case when a dealer or others in want of a saddle horse or hunter can find one in the hands of a farmer that has been handled at all for saddle work. He may have been handled for the plough or the buggy or both ; but nine out of ten young horses on farms to-day in Ontario and Quebec have never had a saddle on. In fact, it is a rare sight to see a saddle on the average farm in these provinces. In the last twenty years I have bought many thousands of horses from farmers, hardly any of which were broken to saddle. If they had been it would have meant just so much more in the farmers' pockets. I know of what I write, for in addition to these many thousands that I have bought, I have judged saddle horses, hunters and harness horses at almost every fair in Ontario as well as at New York, Detroit and Buffalo. Give the boys and girls a chance to see good horsemanship and they will soon pick it up.'

MODEL HORSES FOR DEFINITE PURPOSES.

In this division prizes should be given for army remounts.

Artillery.—Horses suitable for artillery purposes, 15·2 to 16 hands ; weight, 1,100 to 1,400 pounds ; strong, active, blocky horses.

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Cavalry.—Horses suitable for cavalry, 15·1½ to 15·3½ hands ; 1,000 to 1,200 pounds; to be ridden over jumps 3½ feet high.

Mounted Infantry.—Horses suitable for mounted infantry, 14·1 to 15·1 hands ; weight 900 pounds and upwards ; strong, active horses, to go over 3½ feet jumps.

Best Walking Team.—Best farm team, over 1,250 pounds each, with equipment, i.e., harness, wagon, &c. Condition and quality of teams and equipment to determine award.

These prizes not to interfere with the prizes in the regular classes for horses.

Public Opinion with Us.—We have the people with us in these new movements. Public opinion not only in this country, but across the line, is becoming aroused to the need of reform. We began introducing this system of expert judging into the North-west a short time ago, and last year every fair but one in the Territories asked for and received the services of expert judges. This is the second year for the new system in British Columbia, and equal progress is being made there.

But to accomplish all that is intended we must be prepared to do even better work through our expert judges than we have accomplished yet. Different judges have different ideas as to the standard of excellence. We must endeavour to reach a common understanding in this matter. How are we to accomplish this ? We must have a standard of excellence, as before explained, a standard by which animals in the different classes shall be judged. The poultry men have their standard of excellence now, and as a result they have done more for the improvement of poultry than had been accomplished in one hundred years before.

INTERESTING SCHOOL CHILDREN.

There is another point we must not overlook, that is, the necessity of interesting the school children in our fair system. For this reason we have made what is really the first practical step towards the introduction of nature study into our public schools, by offering at several fairs prizes for school children's exhibits. If we are to keep the boys and girls on the farm, we must get them to take an interest and a pride in their profession so that the glitter of city life will have little attraction for them. Such prizes as those offered at the Whitby Fair will lead the children to begin the fascinating study of the elements of general agriculture, economic botany and entomology, &c. So heartily have the children taken up this work that already their parents are declaring that the youngsters know more about the wonders of nature than they themselves have learned in a lifetime.

We must get the boys interested in our fairs. If they come to the fair they will bring the parents with them.

Will the people appreciate an exhibition run on purely educational lines ? I think they will. For proof of this let us glance at the history of the Provincial Winter Fair. Up to 1890 it was conducted by the Agriculture and Arts Association, and such local associations as chose to contribute. In 1892 the Provincial Live Stock Associations took a controlling interest in this important exhibition. The results have been most gratifying. In 1891 there were 81 entries in all classes; $120.50 were received as entry fees, and $68.75 as gate receipts. A total of $189.25 was therefore received, and there was $325 paid in premiums. Under the supervision of the associations there has been a steady growth, until in 1898 there were over 750 entries and over $1,200 gate and entry receipts. The amount paid in prizes was $4,378. In 1898-99 block tests and lectures by the judges in the ring were introduced, and have proven of great value. In 1900 there were over 3,000 entries, and 11,400 persons attended the exhibition. A lecture room was provided with seating for over 600. This accommodation was inadequate. Hundreds wished to hear the lectures who could not get into the room. In 1902 large additions were made to the building and the lecture room enlarged, but

the accommodation was still inadequate. It is estimated that not less than 30,000 people were in attendance. There were 3,945 entries, over $7,000 was paid in premiums, and nearly $4,000 was collected in gate receipts and entry fees.

In this connection I would like to quote a few sentences from the 'Scottish Farmer.' The editor of that paper, Mr. Archibald MacNeilage, who is also secretary of the Clydesdale Stud Book of Great Britain and Ireland, and one of the best informed men on agricultural subjects in Scotland, was engaged to give a number of valuable addresses at the recent winter fairs at Guelph, Ont., and Amherst, N.S. His impressions concerning the value of the educational features of these fairs are indicated by the following extracts from the 'Scottish Farmer':

GUELPH.

January 3rd, 1903.

'The work of this, the Smithfield of Canada, is conducted not exactly on old country lines. In so far as it is on old country lines in the matter of its organization as a fat stock show and carcase competitions, it is a good display of Canadian stock.

'It is when we get beyond this that the real value of the exhibition is seen. Adjoining the judging ring, but completely divided from it, is the lecture room. This is an auditorium which may hold anywhere from 1,000 to 1,500 people. From morning to night it has been packed with interested audiences.

'The Guelph exhibition closed this afternoon, and those of us who have to go to Amherst, N.S., where a similar exhibition opens on Tuesday, are now on our way thither. Reviewing the proceedings at Guelph, one cannot but be impressed with the great educational advantage to be derived from the method pursued there. The attention of visitors is not only directed to the animals shown, but the reasons are given in the lecture room for the decisions.'

AMHERST.

January 10th, 1903.

'The fair has been an unqualified success, and the method of judging adopted has been admirably successful in interesting the public. The building at Amherst is capable of accommodating not less than 1,500 people, and for three days and nights it was packed. Farmers and their wives were present from at least ten miles around, and all the leading folk in Nova Scotia, New Brunswick and Prince Edward Island were forward in force.'

EXHIBITS BY SCHOOL CHILDREN.

Rules Governing Class A.—1. All plants, flowers, leaves, fruits, roots, weeds, weed seeds and woods mentioned in the various sections of Class 'A' must have been grown and collected in the school section making the exhibit. In the case of section 9 the insects must have been caught within the province.

2. Each variety shown in sections 1 to 9 shall be conspicuously and neatly labelled, and in sections 4 to 9 both the popular and scientific name shall be given. The printing or lettering must be done so that it can be easily read. If labels are found to be incorrect, the judges shall mark same incorrect, and re-label properly. Each plant shown in sections 3 and 4 shall be separately tied to admit of individual inspection, and the plants of each variety shall be neatly bound together and labelled with name, locality and date of gathering. In section 5 each variety shall be bound and labelled.

3. In sections 1 to 8 inclusive, no exhibit shall be enlarged by the addition of duplicates. If several specimens of one variety are collected by the children, the

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teacher shall select the best specimen in each case for exhibition, and explain to the pupils the reason for so doing, and why one specimen is better than another. Section 9 shall be subject to the foregoing, but a pair of insects shall be shown, if possible male and female.

4. All the work in connection with each of the exhibits in Class 'A,' sections 1 to 9, shall be done by the pupils under the direction of the teacher, and with his or her assistance and supervision.

5. All plants and weeds must be mounted on sheets of white paper of uniform size (about 11 x 16 inches), and of a weight not less than 70 pounds to the ream, so as to admit of being effectively exhibited, and of permanent preservation as a reference collection in each school.

6. All weed seeds must be exhibited in neat and uniform 8 drachm. (1 oz.) bottles, which, when possible, should be filled to the top, showing at the bottom the cleaned seeds as they occur in nature.

Note.—To facilitate the above, competitors may procure from the Dominion Live Stock Commissioner, Ottawa, at actual cost price, paper of the proper size and weight, as well as botanical labels and suitable bottles.The paper will cost 50c. for 100 sheets, and straight tube bottles with screw metal tops, $3 per 100. Labels will be furnished free.

7. The name of each school making an exhibit shall be displayed above said exhibit in conspicuous letters with a hand bearing name of school at each end pointing to same. These shall be prepared by the school making the exhibit. Divisions between exhibits from different schools shall be plainly indicated by means of coloured paper placed in position by the fair authorities.

8. In the case of a township society the competition shall be restricted to the school sections of the township for which the society is organized, and in case of a district society, the competition shall be restricted to the schools within said district.

9. Exhibits in sections 1 to 9 shall remain the property of the schools which collected and exhibited them.

10. In sections 1 to 9, inclusive, the prize money awarded to a school shall be paid to the teacher, who shall retain 25 per cent, and the remaining amount shall be equally divided among the children who have taken part in making or preparing the exhibit. In sections 10 to 16, inclusive, the prize money awarded shall become the property of the author of the essay.

11. Essays intended for competition must reach the secretary of the exhibition at least one month before the opening day of the exhibition. As soon as the time for receiving has expired the essays will be referred to the awarding committee, who shall make known the awards to the secretary of the exhibition before the first day of the exhibition, and the prizes will be awarded on that day. The essays submitted shall become the property of the exhibition association, and may be published or otherwise, as decided by the board of management, or by the superintendent of fairs.

NOTES.

1. Competitors should begin their work as early as possible in the season. Many plants can only be collected in the spring. All seeds must be thoroughly dry before being placed in the bottles or they will mould and destroy the appearance of the exhibit.

2. Dr. Jas. Fletcher, entomologist and botanist of the Central Experimental Farm, Ottawa, who may be written to free of postage, will be pleased to help any teacher or student applying to him not later than one month before the date of the fair.

CLASS 'A.'

1. To the teacher and pupils of a public school section making the best and best arranged exhibit of roots. This exhibit to consist of three specimens of each variety. At least twelve varieties must be shown in this exhibit.

Prizes:—1st.....2nd.....3rd.....4th.....

2. To the teacher and pupils of a public school section making the best and best arranged exhibit of apples correctly named. This exhibit to consist of four specimens of each variety shown. At least twelve varieties must be shown in this exhibit.

Prizes :—1st.....2nd.....3rd.....4th.....

Note.—Similar prizes for peaches, plums, pears, &c., may be offered in sections where these fruits are grown.

3. To the teacher and pupils of a public school section making the best and best arranged exhibit of grain in the straw the growth of the current year, showing all branches, stools and parts of roots, consisting of one plant of each variety, with not more than two varieties of each kind of grain.

Prizes :—1st.....2nd.....3rd.....4th.....

4. To the teacher and pupils of a public school section making the best and best arranged exhibit of clovers and grasses the growth of the current year, showing all branches and part of the root of each plant. This exhibit to consist of one plant of each variety shown. At least six varieties must be shown in each exhibit in this section.

Prizes :—1st.....2nd.....3rd.....4th.....

5. To the teacher and pupils of a public school section making the best and best arranged exhibit of cut flowers grown in the school grounds.

Prizes :—1st.....2nd.....3rd.....4th.....

6. To the teacher and pupils of a public school section making the best and best arranged exhibit of wild flowers, if possible in bloom, pressed and mounted. Each specimen to be mounted singly on paper (see rule 5), and properly labelled with popular and botanical names, the habitat (as swamp, wood, open field), and date of collection.

Prizes :—1st.....2nd.....3rd.....4th.....

7. To the teacher and pupils of a public school section making the best and best arranged exhibit of weeds, which if possible should be collected while in bloom, cured and mounted; and weed seeds (showing the husk or pod, and the cleaned seeds), in ounce bottles of uniform shape, each specimen and bottle to be properly labelled with name and date of collection. (See rules 5 and 6.)

Prizes :—1st.....2nd.....3rd.....4th.....

8. To the teacher and pupils of a public school section making the best and best arranged exhibit of native woods, together with the leaves if possible. The wood to be in square blocks three inches long, two sides polished, one side showing the natural grain, the other side showing the bark. The leaves to be mounted on sheets as directed in rule No. 5. Each specimen, both woods and leaves, to be properly labelled with the name of the tree and the exact variety.

Prizes :—1st.....2nd.....3rd.....4th.....

9. To the teacher and pupils of a public school section making the best and best arranged exhibit of beneficial and injurious insects, mounted and properly labelled with name, and the crop or product which they attack; or arrarnged in groups accord-

ing to their habits, and in the case of the injurious insects, the fruits, grains, &c., which they attack.

Prizes :—1st.....2nd.....3rd.....4th.....

10. To the teacher or pupil of a public school submitting the best essay on some of the wild flowers of the locality.

Prizes :—1st.....2nd.....

11. To the teacher or pupil of a public school submitting the best essay on some of the weeds of the locality, and how to destroy them.

Prizes :—1st.....2nd.....

12. To the teacher or pupil of a public school submitting the best essay on some of the grains of the locality, and the best methods of cultivating them.

Prizes :—1st.....2nd.....

13. To the teacher or pupil of a public school submitting the best essay on some of the clovers and grasses of the locality, and the best methods of cultivating them.

Prizes :—1st.....2nd.....

14. To the teacher or pupil of a public school submitting the best essay on the beneficial insects of the locality, other than the honey bee.

Prizes :—1st.....2nd.....

15. To the teacher or pupil of a public school submitting the best essay on some of the beneficial and injurious birds of the locality.

Prizes :—1st.....2nd.....

16. To the teacher or pupil of a public school submitting the best essay on the 'Care of Domestic Animals.'

Prizes :—1st.....2nd.....

CALEDONIAN GAMES FOR AGRICULTURAL EXHIBITIONS.

The events and the prizes are as follows :—

Events.	Prizes.		
	1st	2nd	3rd
100 yards dash.....	Silver cup	Silver medal	Bronze medal
Running long jump.	"	"	"
Putting 16 lb. shot..	"	"	"
Running high jump.	"	"	"
One mile run	"	"	"

The winner in each event will hold the county championship for a year. The competitor scoring the highest number of points in all the events will hold the all round athletic championship of the county.

Five points are allowed for a first, four for a second, three for a third, two for a fourth, and one for a fifth.

Only young men from the county will be allowed to compete.

I have displayed on the wall samples of some of these school children's exhibits.

By Mr. Ross (Ontario) :

Q. Last year we had at Whitby several hundred of these.

By Mr. Kidd :

Q. You also had them at the Carleton county fair, had you not ?

A. Yes. The exhibits were really of very great benefit, as the children are familiarized with the appearance of the different plants. Here is a plant that is very prevalent in some sections of Canada and is causing a great deal of trouble, and here is the seed of the same plant. The children are asked to mount these plants on the paper as you see, and to put up the seed in this way in these one-ounce bottles. This plant is the Round Leaved Mallow. It is very troublesome in some localities.

Another plant I have here is the Sow Thistle which is spreading in Ontario, and is very difficult to dispose of. This is the Ox-Eye Daisy. The value of this class of exhibits is that it interests pupils and teachers and also causes them to study the plants and weeds of the district and learn their value or otherwise. If a half a day per week were devoted to this work in each rural school, it would prove a valuable inspiration to the children. Sixteen prizes are offered. The children have taken great interest in it, and it has done great good wherever introduced. Weeds, flowers, apples, roots, potatoes, &c., are each represented. This work was started by the good example set by a school in one of the school sections of Middlesex, and reported in the London 'Advertiser.' This competition was very successful in Middlesex, in South Ontario, and in Carleton County.

By Mr. Kidd :

Q. Yes, that is so. It is a work that has had a splendid effect.

By Mr. Robinson (Elgin) :

Q. Up with us they are talking of a museum in the schools ?

A. Yes, arrange that these children's exhibits in the several classes shall be mounted on cards and kept for the schools collecting them. This was such a success last year that we found it necessary for Dr. Fletcher, the school inspector, and myself to visit a number of schools and show the children the way to mount their specimens on cards, and so preserve them. Upwards of twenty such meetings were held in one county.

By Mr. Wright :

Q. Do you furnish bottles ?

A. Yes, we furnish the bottles and the paper at cost.

Now, I submit this is a very much better attraction than a horse race, and I hope to see these competitions very generally adopted.

MR. KIDD.—I know our people took a very great interest in it last year.

AUCTION SALES OF LIVE STOCK.

THE WITNESS.—The next thing to be dealt with is the provincial auction sales of live stock. It is recognized by all breeders of live stock, and all persons who have paid any attention to live stock breeding, that in order to produce good animals we must use good males of the proper type and bred in proper lines. The farmer must use these males and he must also feed the offspring properly to obtain the best results. These two conditions must go together. He may breed well, but if he does not feed well he will not get as much profit as he should. Realizing that this is so, we considered what we could do to scatter among Canadian farmers more suitable males. We looked to Britain for an example, and found that the growth of the auction sale principle in the last fifty or sixty years was very marked. They have fairs or markets on certain

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days at a great number of points where stock is auctioned. They sell cattle, sheep, swine, &c., in this way. From reliable evidence and observation we found this plan to work very satisfactorily. We met the members of the Shorthorn and other live stock associations, and decided, after discussing the matter very thoroughly, that it would be a good plan to establish these auction sales in Canada, for several reasons. This has been done. The feeling in favour of the method is increasing rapidly. Similar independent sales are being established in various districts all over Canada. It is not the intention that the department shall long continue to assist these sales ; only until they are well established and self-sustaining. Eventually we hope to see monthly or weekly sales established at some central point in each electoral district. At certain seasons of the year pure-bred animals for breeding purposes should be sold ; at other times fat stock, including cattle, sheep and swine, and store animals, should be offered ; in fact, everything that a farmer has to sell. To these sales both buyers and sellers would come. Such a plan would pay the farmer better, and pay the drover better than the plan now generally in vogue. In Great Britain to-day very little stock is sold except at these auctions ; nearly every town or village has its weekly, fortnightly or monthly sale, to which farmers in the adjacent districts take whatever they have to sell. The auctioneers have well equipped yards and sheds in which to sell.

By Mr. Wright :

Q. Would it be advisable to have auction sales after all our fairs ?

A. No. Selling animals at the close of fairs is not desirable. People come to the exhibition for another purpose. The educational value of these sales has been great ; the animals sell for their actual value, a poor animal will bring little money, a choice one all that it is worth. That is an object lesson to a farmer.

By Mr. Robinson (Elgin) :

Q. Is it a fact nevertheless that a great many sales do take place at the fairs ?

A. A few. I do not think a sale at an exhibition can be made successful.

MR. WRIGHT.—I have never known one to be a success.

MR. RICHARDSON.—I notice that the auction sales in England have already done away with other systems. Farmers and drovers found sales to be much more satisfactory in every respect. It entirely does away with this practice of huckstering, and men are satisfied that they get the value of their stock. They get the benefit of competition, and so they hold the sales regularly.

By Mr. Wright :

Q. I suppose these sales operate on the same principle as our cheese sales ?

A. Yes.

PRESS BULLETINS.

The next topic I have to deal with, and I will deal with it as briefly as I can, is the issuing of press bulletins; possibly it is the most important I have yet dealt with. The subjects that I have dealt with heretofore have had to do with all classes of farmers, but this reaches down to the man who does not attend the farmers' institute meetings, nor other educational gatherings. I had not been long at work in Ontario before I realized the great value of the work being done by Prof. Thorne in the United States. He issued frequent press bulletins. The system has been adopted by several

other officers resident in various parts of the United States. As soon as I came to Ottawa we undertook this work, and issued last year press bulletins on live stock and kindred subjects weekly, to some 900 newspapers in Canada. All these papers, of course, did not publish them, but a great many of them did. Several hundred of the smaller papers published these articles weekly. We made them as simple and helpful as possible, yet up to date. It is believed that more educational work can be done by sending good bulletins regularly to the small country papers than by almost any other plan, for by this means information is placed before readers who can be reached in no other way. We found that some of the smaller farmers take a local paper only. The agricultural departments of these papers have heretofore in many cases not been valuable. The following are some of the subjects dealt with recently : 'Feeding Work Horses.' This article embraced the experience of Senator Edwards over a period of twenty years, as well as the work of many other experimentalists. 'Co-operative Testing in Danish Dairies,' 'Shallow Cultivation and Rotation,' 'Management of Farm Labour,' 'Calf Feeding,' dealing with the raising of calves on skim milk, and even without milk ; 'The Cow that Pays Best,' 'Feeding and Management of Colts,' 'Forage Crops for Summer Feeding,' 'Breeding Dairy Cows for Production,' 'The Use of Concrete on the Farm,' 'The Farmers' Interest in Good Roads,' 'The Economical Production of Pork,' and 'Series of Articles on the Adulteration of Woollen Goods.' These are samples of the bulletins issued.

The next subject that I have to deal with is

THE FARMERS' INSTITUTE—ITS VALUE AND PROPER MANAGEMENT.

The object of each local farmers' institute or agricultural society doing farmers' institute work should be the dissemination of agricultural knowledge in its district and the development of local talent. The officers should endeavour to bring the rank and file of the farmers into touch with the most *successful local men,* that the masses may become more conversant with the best and most profitable methods of farming, stock raising, fruit culture, and all branches of business connected with the industry of agriculture.

There are in each district men who have made a success of some particular line of farming, it may be fruit growing, horse raising, dairying or producing beef cattle. These men should be employed to read papers or give addresses outlining their methods and reasons for their success, and the history of their failures ; for it is just as necessary that the farmer, especially the young man, shall know what has not been a success, as to know what has been a success. The public is always benefited by hearing the experience of successful men ; new thoughts and aspirations are aroused, as well as a greater interest in agriculture generally, not only among the farmers, but among professional and business men as well. Not only is there a great benefit derived from employing as institute speakers the most successful men in a locality, but trained men should be, from time to time, brought from other provinces and from neighbouring states, so that methods that have been a success in other and similar districts may be introduced elsewhere ; thus agricultural information travels rapidly. In addition to this it has in the past, and will hereafter, prove very beneficial to engage men from one province to do institute work in another. These men obtain a great deal of useful information not previously known to them, and take it back and scatter it in their own province, as well as taking information to those to whom they speak. Such an interchange of speakers will bring about great uniformity in the exports from Canada. This is a very important feature, for the products of Canada are judged according to their general excellence, not according to the special products sent from any one province. If Ontario exports a poor grade of apples, badly packed, and they are put on the British market as Canadian apples, the growers in Nova Scotia will suffer ; on the other hand, if Nova Scotia sends to the British market a poor grade of pork, and it is sold in Britain as Canadian pork, the feeders in Ontario will suffer ; therefore,

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it is to the interests of the country that the exports may be made as uniform as possible. This can be brought about more readily by an exchange of institute speakers than in any other way. In this way, too, the good qualities of each province become known throughout Canada, and interprovincial trade is thereby increased. Though our export trade is of great value to us, still our home market should be cultivated, for in reality it is our best market.

In view of the importance of the farmers' institute as a means of education in a considerable number of Canadian provinces and states of the American union, the Dominion Department of Agriculture has for the past three years endeavoured to co-operate with the different provincial departments in establishing or improving similar systems in their respective provinces. Trained organizers and speakers have been sent to assist in the work, and the best available men in each province have been pressed into service, not only in their own provinces, but in others as well. In this way it is hoped to get together a thoroughly capable band of institute workers, familiar with the agricultural situation and requirements in all parts of Canada.

The growth of institute work throughout America can be very well illustrated by the growth in Ontario, which is as follows :—

Year.	Membership.	Meetings held.	Attendance.	Addresses.
1885		12		
1886		26		
1887		40		
1888		60		
1889		60		
1890		75		
1891		95		
1892		112		
1893		119		
1894		133		
1895	10,819	303	71,033	
1896	12,384	666	102,461	2,637
1897	15,454	659	125,177	3,277
1898	16,351	658	126,094	3,270
1899	16,808	677	119,402	3,133
1900	18,058	715	138,982	3,328
1901	20,387	730	131,653	3,262

In Manitoba, the North-west Territories, British Columbia, and in New Brunswick, Nova Scotia and Prince Edward Island, institute work has been more recently established but the growth has been very satisfactory, and the demand for speakers greater than the department could supply ; in the various states of the American union we find the same condition.

Concerning the value of this work, allow me to quote from several eminent American authorities. Prof. Clinton D. Smith, Director of the Michigan Agricultural College, says :—

'This work is invaluable to the man who is to do the teaching of subjects ultimately related to practical agriculture. Nowhere else can he find as good an opportunity to put himself in touch with the people and find out their exact situation and wants.'

Prof. A. J. Cook, of California, says:—

'The farmers' institute has become a recognized institution in most of the more enterprising states of our country, having won for itself a place among the several educating influences that are working to benefit the condition of the farmers. It is well, therefore, to consider the matter thoroughly in order that every effort may be

made to the end that each institute should confer the greatest benefit on every one in attendance. When an institution becomes general it is wise to spare no pains, thought, study or exertion to make it as nearly perfect as possible. If the institute were infrequent and influenced but a few, its betterment would not be so important, but as it is now common and affects thousands, all improvement is very important. To secure the maximum good, the institute should be largely attended by earnest enterprising farmers with their wives and families. Each meeting should be made in the highest degree interesting and profitable to all in attendance; and the fruits of the institute should not only be great but lasting in their benefits.'

Prof. W. C. Latta, of Purdue University School of Agriculture, Lafayette, Ind., in writing says:—

'Farmers' institutes have proven a powerful agency for diffusing a knowledge of the best and most successful methods and practices of agriculture. The setting forth at the institutes of the causes of failure and the conditions of success in agriculture by practical men who have themselves been eminently successful, affords a strong incentive to effort and improvement, which is meeting with general and hearty response on the part of the farmers who have attended the institutes.

'Briefly summarized, farmers' institutes have done much to allay the feeling of antagonism between town and country, which was so prevalent at first; to foster friendly relations among the agricultural classes themselves; to increase the general intelligence of the farming classes; to foster the desire for the more thorough education of farmers' sons and daughters, as a means to higher successes, and greater happiness on the farm; to point out the causes of failure and the conditions of success, and thereby improve the methods of agriculture; to awaken new interests and pride in agricultural pursuits; to lift the agricultural classes up to a higher plane of living and achievement and to a clearer recognition of the duties, responsibilities and privileges of the farmer as a business man, neighbour and citizen.'

Prof. C. C. Georgeson, of Kansas, in a very lengthy letter spoke in the highest terms of the value of this work and devotes a good deal of space to methods which are calculated to make it even more successful in the future than it has been.

Whether the farmers' institute work is conducted by what is known as farmers' institutes or by agricultural societies matters very little, but the first consideration is that in order to conduct this work satisfactorily the province or territory must be divided into divisions; the size of these divisions must be determined by the density of population. Where the country is old and well settled the divisions may be somewhat smaller than where the population is scattered, but in any case the bounds of each district should be established just as carefully as in the case of an electoral district. This is important. If it is not done the superintendent or the commissioner in charge will have no means of telling whether or not a district has been properly served and its interests looked after. Where the province is divided into townships or parishes, four or five of these townships make an institute district of suitable size. In each institute district an association should be formed, if not already existing, and as I previously stated this may be a farmers' institute or it may be an agricultural association; it matters not what you call it as long as the work is well done.

This association should consist of a president, vice-president and a board of directors, one or more directors to represent each township or parish in the institute district. This board should have a permanent secretary, who should continue in office during good conduct. His duty should be to carry out the rules and regulations governing the farmers' institutes and to conduct the work of the institute under the control of the board of directors.

Each local institute should hold an annual meeting each year, at a time fixed by the Department of Agriculture ; this date should be at the end, and not at the beginning of the institute year. At this meeting the directors and officers should be chosen

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as well as the points at which the meetings for the succeeding year are to be held in the district. Within ten days of the close of the meeting, a full report of the meeting, with the names of the officers and directors, should be sent to the Superintendent of Institutes, or the official appointed by the department to control this work. The officers and directors appointed at this meeting should continue in office for the following year or until the close of the series of meetings then mapped out. As soon as the superintendent has received the report of the annual meetings from each of the local institutes, he should at once arrange the meetings in circuits or, as they are usually called, districts. These districts should consist of about from 18 to 21 meetings arranged in consecutive order, so that the speakers can commence, say, on the first of a month and continue to address meetings daily, Sundays excepted, until the circuit is concluded. This will give steady employment to, we will say, two men for about twenty or thirty days. By this means the services of better men can be employed than if they are chosen for individual meetings, and the men chosen can afford to devote plenty of time to the preparation of their addresses, and can carefully study the subjects that they are to take up.

The advertising of the meetings and the choice of the subjects to be discussed should rest entirely with the local association, but a clause in the rules and regulations should give full directions. The following is the clause adopted in several provinces to govern this department :—

'Every meeting of an institute, except the annual meeting, should be advertised by issuing posters, not less in size than 15 x 20 inches, on which should be printed an attractive programme of the meeting, giving date and place of meeting, hour of opening, the names and addresses of the speakers, topics to be discussed by each, also the hour at which each speaker will address the meeting, the time to be occupied by each address, also the time allowed for discussion after each address, and such other information as the executive deems necessary. A copy of said bill should be sent, at least two weeks previous to the date of meeting, to each postmaster, each schoolmaster, each miller, each blacksmith, and to other places of public resort in the district which are within a radius of ten miles of the place of meeting, with a request to post in a conspicuous place. It shall be the duty of the officers and directors to exercise diligence to ensure the proper posting of said bills. In addition thereto, a programme of convenient size, containing similar information, should be distributed so as to reach its destination at least ten days previous to date of meeting. A copy of said programme should be sent to each member of the institute, to farmers, journalists, public men and others in the district who reside within ten miles of the place of meeting. Such posters and programmes should announce that all interested are welcome, whether members of the institute or not. Copies of said programmes should be sent to the school teachers in the district, with the request that they be carefully distributed among the children.'

The next point to be considered is the choice of speakers. In arranging meetings in circuit great care must be exercised to group together districts having common interests, for instance : Division No. 1 may embrace districts devoted to corn-growing, dairying, and fruit-growing to a limited extent ; division No. 2 may contain districts devoted to fruit growing, grain growing, dairying, and pig feeding to a limited extent; division No. 3 may contain districts devoted to beef growing, grazing, and corn growing. The choice of the speakers will rest entirely with the superintendent and his advisory committee. Men should be chosen because of their adaptability to the work ; religion or politics should take no place in the choice of these men. For instance : a dairy speaker is required, a man should be chosen who has been a pronounced success in this line of farming ; besides this, he must be intelligent, honest and of good character, and respected in the district from which he comes. If he has these qualifications, he may at first not be a good speaker and only capable of reading papers ; but if he has the other qualifications, he will soon overcome this difficulty,

and in any case, after reading his paper, he will be asked questions, and in answering them he will be drawn out and forget himself, and at the same time be imparting good, useful information. These are the kind of men that have in all cases grown to be the best and most efficient institute lecturers. This line of reasoning applies to all classes of farming. It is better to send two men on a deputation, because while one man may be able to do the work, it is seldom that one man has sufficient information along all lines to meet the requirements of a large series of meetings; besides this, if a single delegate were sent, the meetings might be interrupted on account of sickness. In any case, it is better to have specialists address meetings than men having general knowledge. After a man has been chosen and has proved himself an efficient institute worker, the superintendent should use every effort to develop him. He should be supplied with all the latest and best books and bulletins dealing with his subjects, and he should be asked to read and study them. In case he does not advance and become a better man from year to year, it will be necessary to drop him as soon as a better man is discovered. To be an acceptable lecturer at farmers' institutes, a man must be a constant student. It is better, as a general rule, to employ men as lecturers who are only a little in advance of their fellows, than to employ professional men and scientists who will talk over the heads of the masses and disgust them and disappoint them with the result of the meetings. Nevertheless, it will be found wise from time to time to introduce, especially to the larger meetings, specialists who have made a study of some particular branch of agriculture. But in choosing speakers, I would warn superintendents against choosing men who profess to know all there is to be known about the various branches of farming. I have had men appeal to me for appointments on the institute staff who declared that they knew everything about farming, dairying, growing potatoes, the cultivation of the soil, corn growing, pig feeding, market gardening, crop growing, and apple culture. I have never found a man of this sort to be of any use. The knowledge of such persons is too vague ; in 99 cases out of 100 they are theorists, and will do more harm than good to the work under consideration. The choice of speakers is the most important matter.

Another important matter that will concern the superintendent is the enforcement of the rules and regulations. Careful rules and regulations should be drawn up; they should be submitted to the various institutes and accepted by them and then issued. The rules that govern one institute should govern all others. In other words, there should be an exact uniformity throughout the whole system. After the rules have been accepted and printed they should not be changed. Here and there institutes will be found that want something special in the way of rules; this should never be granted. It may seem arbitrary to deal in this way, but I have found that if rules are trifled with from year to year they are more likely to grow worse than better. Confusion will creep in, and soon if there are forty institutes in the provinces there will be forty sets of rules, making it impossible for any superintendent to control the work. The result will be the system will fall into disrepute, and the institutes fail in the object for which they were established.

To recapitulate, the first consideration is that the institute districts be well defined; that local associations be formed; that these associations, acting under the rules and regulations prescribed by the department, shall have full control of the work, fixing the dates at which their meetings shall be held, and appointing their speakers; that a list of meetings shall be published each year; that the list of speakers and list of subjects shall be issued in pamphlet form at least three months before the meetings are to be held; that the local institutes shall select the topics to be discussed at their respective meetings from among those attached to name of the speakers as given them; that the advertising be thoroughly done by the local committee, and that they be held responsible for this work; that great care be taken in the selection of speakers; that the speakers be carefully educated and developed after they have been chosen; that each speaker be held responsible for prompt attendance at each meeting for which he is advertised, and if a speaker fails to attend meetings for which he is advertised it

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should be understood that he will receive no compensation for the time he has been out, either for wages or expenses, even when the cause for ceasing work is urgent. Such delegate should notify the superintendent in time, that his place may be suitably filled by another, otherwise persons who attend are disappointed. The public must be given to understand that the superintendent and the Department of Agriculture are not playing at agricultural education, but that the work undertaken is done in good faith, and in the best interest of the people. All lecturers, officers and directors must be taught these facts. They will learn them very rapidly. Strict adherence to these rules, and the careful selection of speakers, have been the reasons of the great success which has attended the institute work in Ontario.

The value of the institute work in Ontario has been particularly noticeable in the growth of the bacon trade. In 1890 Canada exported, principally from Ontario, $600,000, worth of pork. Ten years later $12,600,000 worth was exported to Great Britain. This work was in a large measure due to the work of the farmers' institute. For several years previous to 1900 pig growing and fattening had been made a special subject at all farmers' institute meetings. The needs of the packers and the requirements of the British market were carefully explained and illustrated year after year.

By Mr. Sproule :

Q. Don't you think there was something else; that the pork growing was made profitable beforehand by shutting out the great supply that had been coming in from the west and that had made it unprofitable ?

A. No. I think the institutes had more to do with it than anything else. Their work was very thorough. If it was not due to the work of the institutes, why was there not more grown in Nova Scotia and New Brunswick. There has been little increase in swine there; even now they are importing much of the bacon used.

By Mr. Robinson :

Q. I suppose you are aware that the farmers had an organization before the establishment of these institute meetings ? The Grange was organized thirty years ago, and they had meetings doing similar work.

A. Yes.

By Mr. Roche :

Q. The meetings are held in conjunction with the provincial departments ?

A. Always in connection with the provincial governments. In taking up work in any province we co-operate with the Provincial Department of Agriculture, and never undertake anything in any province that does not meet with the hearty approval of the provincial governments. The work is going on very well. I have just had a letter from Mr. Peters, Deputy Commissioner of Agriculture in New Brunswick, who writes :—

'We are now putting on a series of orchard meetings, giving practical illustrations in spraying, &c. The first meeting was held opposite Fredericton yesterday afternoon, and was very successful; nearly a hundred interested farmers were present, and seemed very much interested with the necessity for this work. I inclose you a copy of one of the posters which we are getting out for these meetings; also copy of a spray calendar, which we are spreading broadcast.

(Signed) THOS. A. PETERS.'

A member of Prof. Robertson's staff is there conducting the work with the assistance of the local authorities.

By Mr. Broder :

Q. Where ?

A. Near Fredericton.

I have a letter also that came in this morning. It is from Mr. H. B. Cowan, who is now connected with the *New England Homestead.* He at one time assisted me in the re-organization of the fairs. He writes :—

'I am making arrangements here to conduct a model educational exhibition at the Worcester Fair, probably the wealthiest fair in the New England States. It has something like $43,000 in the bank, and no debts. I have been running a series of fairs articles in the *New England Homestead,* using your ideas and suggestions very liberally. They have so impressed the people down here, that this society has come to us asking us to take hold of it and run such a fair.'

The only trouble now, so far as our farmer's institutes are concerned, is the lack of funds. We need more money to carry them on. We must find good men for the work, and they need a good deal of training after we find them.

MR. KIDD.—Our halls are always crowded at our meetings for institute work.

Having read over the preceding transcripts of my evidence of April 8th and 24th, I find them correct.

F. W. HODSON,

Dominion Live Stock Commissioner.

CLIMATE AND SOIL OF THE YUKON.

HOUSE OF COMMONS,
COMMITTEE ROOM 62,
FRIDAY, April 17, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock a.m., Mr. Douglas, chairman, presiding.

Prof. John Macoun, Assistant Director, Naturalist and Botanist of the Geological Survey of Canada, was present by request of the Committee, and made the following statement in regard to the agricultural possibilities of the Yukon Territory :—

EARLY SCIENTIFIC EXPLORATION OF WESTERN CANADA.

Mr. Chairman and Gentlemen, last year I was sent by the government to the Yukon to conduct an inquiry there. I may say that I am the government Naturalist, and have been such for many years. It was I who was chosen to go with Sir Sandford Fleming to the North-west when he made his first trip across the country, 31 years ago this year, and my report on the North-west the following year had much to do in opening the eyes of our eastern people. To the generation that has passed away, I was a sort of a prophet, but it was not prophecy ; it was simply a deduction from other knowledge that I had ; and the remarks that I am going to make to-day are not a prophecy, they are merely deductions from actual facts, and after I am dead, and many of us are dead, my words will come truer than they are to-day. After 30 years we have now awakened to the value of the North-west, and now we all believe in it. As long ago as 1877, I was asked by Mr. Alex. Mackenzie, who was then premier, to write a report on the capabilities of the North-west. In that report I stated that the possibilities of it were unlimited, and that they were only limited by the capacity of the cultivators. You all say that to-day. I hope before I am through to show you that the North-west is only the entrance to the wonderful country we have got. From Edmonton right to the Klondike the greater part of the country is suited for settlement, much for the growth of wheat, and an immense extent for the growth of cattle and sheep and horses. These are strong statements, but I will now show you why I make them.

When I was sent up there last year I had very crude ideas of the Yukon country, and this was because very conflicting reports had been made regarding it. One gentleman would come from the Yukon and tell us that the land was all covered with moss, and not only was it covered with moss, but one or two feet from the surface it was solid ice. Another says there is no timber in the country. Somebody else says only the hardiest vegetables can grow, as it is so far north. Mr. Tyrrell, one of our staff, was sent there in 1898, and the rule with the Geological Survey staff is, if they are in a new country, to gather specimens of the flora—the trees, flowers, shrubs and plants—that are growing there, and bring them to me, and from these I tell them the character of the country, though I have never seen it. Mr. Tyrrell brought me back a number of specimens, about 160 species, and after he had submitted them to me and I

had examined them and named them, I wrote in my report on the plants, that they might have been collected, with the exception of eight or ten, 180 miles north of Ottawa; and that the spring and summer climate of the vicinity of Dawson was mild as that of eastern Canada. That was in 1899.

WHAT AN OFFICIAL VISIT TO THE YUKON IN 1901 REVEALED.

Last year our acting director, by direction of the Minister of the Interior, suggested that I should go and examine the Yukon country for the government, and I went. I would not go from here until late in June, for the reason that I had been in northern countries, and I told our director, 'I am only going to waste my time by going so early, for nothing can be growing.' I did not leave until the latter part of June, and I reached Dawson on the 10th July last year. Dawson is over twenty degrees north of where we sit, in latitude 64° 15'. When I reached there I found red currants, blueberries and strawberries perfectly ripe on the hillsides on the 10th of July. Well, of course, I was more than astonished. There is a rose that grows here that we know as Rosa acicularis, and on the 3rd of June last year I found it with the first flower expanded at Aylmer, Que., nine miles from Ottawa. It happened that Mr. Tyrrell's brother, James Tyrrell, was out on the hillside at Dawson on the 2nd of June, and he found the same species in flower there, one day earlier than it was here. To me it was an enlightenment. I had gone there with preconceived opinions of what I had heard, and this was a revelation indeed. I want to show you gentlemen what the flowering of that rose here and at Dawson meant. The same amount of heat had to be poured down on both districts to produce like results. When I reached the country I found the rose hips red and getting ripe when I thought they would be only starting to bloom. That gave me something to think about, and I turned to Mr. Tyrrell, and I said: 'Mr. Tyrrell, what is the cause of this flower blooming earlier here than in Ottawa?' Here is his answer. He said: 'Mr. Macoun, it is the long day and the great amount of sunlight.' I said: 'You need not tell me that, I know better.' I said: 'You, Mr. Tyrrell, were up at Chesterfield Inlet, on Hudson Bay, and found plants that indicate perpetual frost, and still you were not as far north as here. If it was the sunlight, why does it not give it at Chesterfield Inlet as it does here?' You see, the matter was simple. I was not going to accept this man's dictum or that man's dictum; I knew that for every effect there was a cause. Let me go back to the coast now, and we will see what I am talking about. On the coast from below Wrangell, that is down near the border of British Columbia, the great glaciers come down from the mountains to the sea, and as you go up Lynn canal the mountains come down to the sea, and you will see the glaciers starting at the mountain summits and coming down to the sea, and actually flowing into it. If you look at the map you will see that all the coast range from Wrangell northward is very high, and in all the bays and inlets there there is much ice, and glaciers of immense size enter the sea. There is a great tract of country there under great glaciers and partly covered with eternal snow. In this region rise Mount St. Elias, Mount Logan, Mount Fairweather, rising between 16,000 and 20,000 feet above the sea. Well, the people coming up the coast believe the interior is like that, and form the erroneous opinions which have prevailed, but here is the remarkable fact, that no glacier ever was at Dawson, that Dawson has never been covered with an ice cap as it has been here, that no one of our geologists has ever discovered glacial action at Dawson or within 200 miles, or I might say within 300 miles, of that place.

THE WONDROUS SHELTER BELT THAT PROTECTS DAWSON.

I stood at Dawson and turned south, and I found by the map that this mass of mountains towering 20,000 feet into the air covered with glaciers and constant snow

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lay between Dawson and the sea. Now, we know that the Pacific in that part and northward is almost constantly covered with fog, and the atmosphere is at the point of precipitation, and as that moisture comes into contact with these mountains, it comes down in snow, causing the glaciers. The air passing over the mountains, relieved of its moisture, descends on the plain in the interior, as a dry warm wind. This is the result of two causes, the want of moisture and friction caused by the descent of the air to the plain. So that if you wish to call it so, the conditions at Dawson are those of a perpetual Chinook in the summer time. So long as the land lies as it does with these big mountains around the sea coast, so long will the climate at Dawson in the summer time be as it is. So long as these mountains have been heaped up, there never has been permanent ice in the Klondike valleys. But someone says, is there not ice all the time ? Yes, but I will show you what it means. The mountains and the hillsides have never been covered with solid ice ; there has always been sun enough in the summer time to take it away. Mr. Stupart in his report that I have here, shows that the rainfall at Dawson for six months never averages more than seven or nine inches—now then, with that light rainfall, and eighteen hours of sunshine on an average for over three months, and no wind, what do you get by it ? What would you expect ? Do you think that the growth I found is phenomenal ? It is phenomenal for that region, but not for those conditions. You see at once what I mean. I mean to tell you that the conditions at Dawson are phenomenal, but that the growth at Dawson is not phenomenal according to the conditions. Now, having found all this and having studied it out there, I may mention a point that I did not understand. Dawson stands in a swamp, in part, and what was peat bog, when the place was first settled. The trees grew in a bog, precisely like any peat bog in this country which is partially covered with tamarack, only it was covered with spruce instead about twenty feet in height. The bog was coated with peat moss, and not only that, it was solid ice, and on it Dawson was built. Well, Dawson is, as I have said, in latitude 64° 15′, it is 1,200 feet above the sea and right back of the city rises Moose Head Mountain, with an altitude of 2,500 feet above the city. After I was there two or three days I decided that my view was circumscribed, and that I would have to get up the mountain and get a wider outlook. I went up to the top of the mountain, and when I was going up I made a point of writing down everything I saw the whole way up.

A PROBLEM SOLVED.

When I got up about 2,000 feet above Dawson, well say about 1,500 feet above Dawson, or 1,000 feet above Dawson, I found a plant in flower. But when I went up 500 feet more I was astonished to find it in seed. Now, there was a phenomenon which might be simple to a person that was not considering the thing, but that was to me a problem to investigate, and I kept at that for two months, and I could not fathom it. I went on to the top, and on the summit of the mountain I was looking for Arctic plants. Up to this time I had not seen any plant around Dawson indicating summer cold, and on the mountain summit found none at an altitude of 3,750 feet above the sea. When I stood on the top of the mountain and looked away to the north, and to the east, I saw a range of mountains, the Ogilvie Range, about 40 miles off, and in these mountains, they were over 8,000 feet high, I could only see a patch of snow here and there in a gully and the mountain tops had no snow at all. In going down the mountain I went straight down the side ; I had gone up on the slant. When 500 feet below the summit, I came across stumps of spruce trees over 20 inches in diameter. Right back of Dawson City, not a mile from the centre of the city, on the mountain side, I found these stumps, not one or two of them, but hundreds of them running from a foot to 20 inches. They formed a belt on the mountain ; but when I came down through these the trees got smaller, and when I went down into the city, the stumps only indicated small poles, the trees had not been more than 10 or 15 feet high. This was another problem that took me a long time to

solve. But later in the season I climbed a series of these mountains, and I invariably found one thing—that when I left the creek bottom, the bottom of say Bonanza creek, or Eldorado creek, or Hunker creek, or Bear creek, or Gold Bottom creek, or Sulphur creek, I found that in all these creeks in the bottom the trees were short, and when I went up they increased in size so that when I got 1,500 or 2,000 feet above the creek bottom I discovered this belt of big trees. I went to Gold Run creek, 48 miles from Dawson, in the stage, in one day. They have good roads there now, thanks to the old commissioner, Mr. Ross ; he has made roads there, sir, that are a credit to any country, and what is more, a credit to any engineer. The earlier roads were built over the hills away from the creeks, because of the belief in perpetual ice and frost by the creeks. The day after I reached Gold Run creek, I was walking along the road with the Gold Commissioner, and we came upon trees lying by the roadside from 50 to 70 feet long. They use trees for the purpose of hoisting buckets out of the mine ; they put the tree down into the mine and hoist the buckets up by means of this tree. I said to the Commissioner :

Where were these cut ? He turned round and said :

'You see that creek there. They were cut away up yonder at the head of that creek.'

It was the same thing that I had been bothering over all summer, and now I got the solution, and you see how simple it was.

WHAT A LONG SUMMER DAY BRINGS ABOUT.

Let me go back now to make it plain if I can, and you will see how easily these things are wiped away when the explanation is suggested. You remember that the statement of the people who went in there first was that the whole country was covered with a thick coat of moss, that there was no timber, that there was solid ice under the moss, and that nothing would grow. Well, that was true and it was not. You know that a partial truth is worse than a lie, and that was a part truth for this reason, and here is where the lie came in. You will understand that last year I was there for eight weeks, and I never saw a star. It was never dark enough to see a star. From the 10th of May till about the 7th of August there are no stars to be seen. The day is from 18 to 22 hours long, and there is no night there. It is simply a twilight. You will understand that this goes on all the time. Now, then, you will see how this works out. Here in the city of Ottawa, if you cover ice either at the present time, or rather two weeks ago, with two feet of peat moss, or two feet of sawdust, which is just as good for keeping out the heat; put two feet of moss on a piece of ice here, and you will not be astonished to find it still there in the latter part of August. But if it was found in the Klondike it would be regarded as quite a remarkable thing. The mountains are all rounded, the valleys are all open; there are very few cliffs, except near the main river, the Yukon. The creek bottoms are just like tamarack bogs or swamps. They are covered with little bits of spruce trees from 5 to 25 feet high, and bushes of dwarf birch. Now that applies to all the creek bottoms in the Klondike valley. Now, begin to ascend out of the creek on the side facing the sun, and you very soon get out of this moss, and by and by you get where there is no moss at all, and as you get up you find where the sun shines on it all the day what you would expect here, dry ground and an arid or dry soil; and this is just what you do find. I do not believe that in a generally level country there would be a great deal of frost up there by the time the autumn would come, with the sun pouring down for three months in the year. Now let us come to the other side of the valley, and here the sun, being quite low, would certainly not come early in the morning to the part of the valley inclined away from the sun the whole summer. During the winter, with the thermometer going to 40°-60° below zero, and a light snowfall, the penetrating power of the frost is certainly enormous. Now the sun does not pour down on that side, therefore it does not thaw, and on this side of the valley that is what you would call the south side facing

the north, you will find the moss and small trees far up the hillside, and you go pretty well up before you get where the big trees grow. Now, I am coming to the point of the big trees. I discovered the big trees were growing on the mountain sides when you got up out of the valleys, and got high enough for the sun's rays to be quite unobstructed, to produce this big tree growth. You would see where the effect of the sunshine was lost, and when you came to a place where the sun would not shine for more than two or three hours a day you passed from the big tree growth, and down in the valley there is little growth to be seen. Now you see if a man would talk about the big trees on the top this would be the explanation of it, but of course many people will say, as people said at first, that there are no big trees in the country, but only little bits of scrub. There is nothing but little bits of scrub down in the bottom of the creeks, but when you get up where the sun can get at the soil then the whole conditions are changed. Now, what is the cause of this misconception. The miner digs in the creek where there is a great deal of ice under the moss, and here they have passed through frozen gravels to 30, 60, and even 100 feet below the surface. As the trees are cut off the hillsides and the sun is let in, the frost in the ground will gradually disappear. This was well shown last year before I left Dawson on the 25th August. They have there a system of mining called hydraulic mining. At 44 Hunker, where two years before they had dug a ditch and only got down 2½ feet, last fall on the same slope they went down after the 20th between 12 and 15 feet before they reached the frost, and the day will come when it will all disappear in places that constantly receive the sun's rays.

SOME TALL TREES,—A MAN WHO APPRECIATED THEM.

If you will bear with me, I will explain another point that has caused a great deal of misconception. In the Yukon valley, for instance, going down to Dawson you come to a point where there is a tamarack swamp, with small, stunted trees, and yet, scarcely a mile from it you have passed one covered with trees running up a 100 feet. How could any man see these trees and say the whole soil is frozen solid 2 feet beneath the surface ; yet this is what we have been told by many describers. How could any one see the two things and make the one statement ? You see how simple it is when you look at it properly.

By Mr. Wilson:

Q. Trees 100 feet tall ?

A. Trees 100 feet tall and over, and I will tell you where they are at this time, in a big grove. There was a man at Dawson named Boyle who got the government four years or so to give him a concession, as they call it up there, of the timber in the Klondike valley. I am telling you what I was told. The then commissioner, Mr. Ogilvie, said to Boyle that he was a fool to apply for such a thing. Ogilvie said : 'There is no timber there'—mind you this was not more than four or five miles outside of Dawson, near Bear Creek—'there is no use asking for it as it is worth nothing;' and I was told at Dawson that so Ogilvie reported, and Boyle got the concession. Now the people at Dawson are swearing at the government for giving the concession to Boyle, because they find he has a good thing. I stopped in the grove for a short time to look at the timber, and there are hundreds of beautiful spruce, running up at least 100 feet high, with scarcely a limb at all except a few at the top and as straight as an arrow ; not a bent tree in the lot ; the most beautiful spruce I ever saw.

By Mr. Stephens :

Q. How large would they be ?

A. They run from 12 to 20 inches thick; but I put it down in my book here at a foot to 16 inches : beautiful white spruce ; the cleanest and most beautiful spruce

I ever looked at. And that is growing within six miles of Dawson. Then north of that there are immense groves of what we call balsam poplar; fine, beautiful trees.

Late in August I called on Commissioner Wood and Mr. Smart in their office at Dawson, and related some of my discoveries. While talking with Mr. Smart and Commissioner Wood I made some statements regarding the growth of wheat in Manitoba, and Mr. Smart entirely agreed with me. I then said that wheat growing would yet be successful at Dawson, but I did not know then that my knowledge was forestalled by Mr. Stupart. Allow me to read a short extract from Mr. Stupart's report for 1901 in connection with it, and then I will take up my own story again.

CLIMATIC CONDITIONS AS TO TEMPERATURE.

By Mr. Wilson :

Q. What is the date of the document ?

A. That is Mr. Stupart's report for 1901. Here is what he says on the climate of Dawson and the Yukon, made out from the meteorological readings. Mr. Stupart says :—

'A somewhat broken series of observations at Dawson and various other places in the Yukon Territory between 1895 and 1898, and a continuous series at Dawson during the past three years, afford data for estimating with a fair degree of accuracy the average climatic conditions of the Klondike. The average annual mean temperature is about 22 degrees; the mean of the three summer months is about 57 degrees, July being 61 degrees; and of the three winter months 16 degrees below zero, with January 23 below zero.'

By Mr. Wright :

Q. You say that is Centigrade ?

A. No, Fahrenheit. 'Spring may be said to open towards the end of April, the last zero temperature of the winter usually occurring about the 5th of this month. May, with an average temperature of 44 degrees, is by no means an unpleasant month, and the 23rd is the average date of the last frost of spring. That is the 23rd of May. Daily observations during five summers indicate that on the average the temperature rises to 70 degrees or higher on 46 days, that is very nearly every second day over 90 days—and to 80 degrees or higher on 14 days ; 90 degrees was recorded in Dawson in June, 1899, and 95 degrees in July of the same year. These temperatures, with much brighter sunshine and an absence of frost during three months, together with the long days and a latitude within a few degrees of the Arctic circle, amply account for the success so far achieved by market gardeners near Dawson in growing a large variety of garden produce, including lettuce, radish, cabbage, cauliflower and potatoes, and warrant the belief that the hardier cereals might possibly be a successful crop both in parts of the Yukon Territory and in the far northern districts of the Mackenzie River basin. August 23rd would appear to be the average date of the first autumnal frost, the temperature rapidly declining towards the close of this month. Although night frosts are not infrequent in September, the month as a whole is mild, with a mean temperature of 42 degrees. October may be fairly termed a winter month, the mean temperature being but 22½ degrees and the first zero of winter recorded on the average about the 18th. Ice usually begins to run in the Yukon about the second week, but it is not until quite the end of the month or early in November that the river is frozen fast. The temperature on the average during a winter falls to 20 below zero or lower on 72 days, to 40 degrees below or lower on 21 days, to 50 degrees below or lower on 7 days, and to 60 degrees below or lower on 2 days. In January, 1896, 65 degrees below was registered at Fort Constantine, and in January, 1901, 68 degrees below was recorded at Dawson. Observations of rain and snow have until the close of last summer been very fragmentary, but it is probable that the summer rainfall near Dawson is usually between 7 and

9 inches, and that the total snowfall of autumn and winter is between 50 and 60 inches. Dawson being situated near the river with high hills or mountains on all sides, is well protected from the winds, and a feature of the town, and indeed of the neighbouring country, is the long periods of calm weather which occur.'

Now, when I read that, Gentlemen, I said to myself, 'you have not made the discovery you think you have.' But I have made this discovery. What Mr. Stupart learned from meteorology, I learned from phenological observation, that is examination of the plant life ; and it is just as easy for me to tell the climate of a country by the vegetation as it is for any gentleman in this room to take up a book and read common English type. But this opinion of mine about the Yukon is not mine alone. I have in my hand a lecture delivered by an American judge, Hon. James Wickersham, United States district judge of Alaska. I had the pleasure of coming down from Dawson with this gentleman last fall. We talked practically the whole way up the Yukon, except at meal times, and the burden of our discourse was the capabilities of our respective districts. On such subjects Judge Wickersham and myself kept up the discussion for four days. He delivered the lecture that is in my hand, at Seattle on November 5, and at Tacoma on November 11. I will read you a little of what he says of the climate of Alaska, and I agree with every word of it. He says :—

CLIMATIC CONDITIONS OF ALASKA.

'Alaska has two climates. Along the Pacific sea coast from south-eastern Alaska to the Aleutian Islands it is excessively rainy ; the great flat Yukon interior is dry, and in winter, excessively cold. The moisture arising from the Kuro-Shiwo, or black stream of the Japanese, is precipitated in rain and snow on the south flank of the coast range ; the excessive rainfall and a low temperature feed the Muir, Malaspina and other great glacial fields. The casual tourist sailing along the front of these stupendous glaciers reaching down from the cloud-capped heights of the St. Elias range, is largely responsible for the widely prevalent impression that the climate of Alaska begins with these ice fields on the south and extends away to the Arctic ocean in increasing intensity. Just the opposite to the fact. There are no glaciers in the interior of Alaska, nor on the Behring Sea or Arctic Ocean slopes. Glaciers are formed by an excessive rain and snowfall in a high altitude and in a constantly low temperature. These conditions do not prevail in Alaska except along the south slope of the St. Elias range. The Yukon interior is low and flat, the Yukon river, where it crosses the British boundary line at Eagle City, is but 800 feet above the sea-level—though nearly 1,800 miles from its mouth. The rainfall in this vast region, from Behring Sea to the British line, from the Arctic Ocean to the inland slopes of the St. Elias range, is not more than 12 inches per annum, a little more only than falls on the parched mesas of Arizona. A foot of snow and rain falls on the south coast for every inch in the interior; the heaviest rainfall in the interior occurs in August; the winters are dry but cold; the summers are warm. The sky is clear and bright during both seasons.'

Then he goes on to say :—

'The winter climate is no more trying than that of Helena, Montana.'

This is Alaska he is talking about.

'Owing to the limited rainfall north of the St. Elias range the interior would be a cold and arid desert if the ground was not constantly frozen to a great depth.'

FROST AN IMPORTANT FACTOR IN AGRICULTURE.

Now notice that the frost, as I will show you, in a moment, is the great factor in the Yukon for agricultural purposes.

'Owing to the limited rainfall north of the St. Elias range the interior would be a cold and arid desert if the ground was not constantly frozen to a great depth. During the long summer days the heat of an almost tropical sun thaws the surface to a depth of a few inches, below which a subterranean cold storage furnishes the necessary moisture to the plant roots.'

This applies in our country. That is what I want to draw your attention to later.

'These vast ranges are then clothed in a summer suit of flowers and grass ; herds of wild reindeer migrate from pasture to pasture like the buffalo of the Missouri plains

'If all other stock shall fail, both the Siberian and native reindeer will flourish even on the mountain summits without prepared food or shelter, and will furnish meat to the future Alaskan.'

'Forests of good timber, all sufficient in size and quantity to supply local needs, fill the Yukon and tributary valleys, the best lying around Fort Yukon above the Arctic circle. The Gulf Stream of the Atlantic tempers the climate of Norway and Sweden, the Japan current that of Alaska. Nature's wringer, the great coast range of Alaska, extracts the moisture, and permits the freed and warm dry air to reach the interior, and mitigates somewhat the rigours of its Arctic climate. Dutch Harbour is on the 55th degree of latitude; Edinburgh, Newcastle, Glasgow, Copenhagen and Moscow are on the same degree. Valdes on the 60th degree is on the same line with Christiania, Stockholm and St. Petersburg. Nome, Rampart and Eagle City are not farther north than the populous regions around the Gulf of Bothnia.' Then he winds up by saying: 'the Yukon basin produces good crops of potatoes, cabbage, carrots, beets, turnips, lettuce, and other vegetables. If congress will encourage settlement by the passage of a law similar in spirit to the Oregon Donation Land Law, a population of a million farmers will inhabit the valley of the Yukon within a century.' That is north of Circle City. So you see, gentlemen, that is what an American says of their country.

SUMMER IN THE VALLEYS OF THE KLONDIKE AND THE YUKON.

I have shown you about the climate, and if you will allow me I will now show you about the production. I have noted here in this book everything that I did, so that you will understand, gentlemen, I tried to do the best I could in the interests of what I went for. I examined the gardens in the valley of the Klondike and the Yukon, early in July, and found everything growing luxuriantly and wonderfully vigorous. On the 5th of August I examined the gardens in the Klondike, and I have that noted in my book for future reference. I found cabbage cut then, that on weighing were found to be from 3 to 5 pounds weight; these were being sold in the city. Potatoes had also grown; in fact everything was growing beyond anything that I had ever seen here. The reason was—I will give you the basis of it. The point I want to make is this : I tried to impress upon the men there that they had been neglecting to sow their grain early enough. I mentioned this to the commissioner, Mr. Wood. I said: 'You know that when the Manitoba farmers learned to sow their grain early they began to reap decent crops.' These people do not realize that as soon as they have three or four inches of soil free from frost they should sow the grain. Mr. Wood said: 'Do you not know that frost comes after that ?' I said: 'The frost coming after that may hurt the leaves, but it benefits the roots.' You see he did not realize that fact. There is the point. If these people sow early they will get better results. I am going to show you in a moment why I impressed that upon them.

By Mr. Wilson :

Q. Does early frost have the same effect in Manitoba as in the Yukon ?
A. Yes.

APPENDIX No. 2

Q. You say that early frost helps the roots while it hurts the leaves ?
A. That is what I preached thirty years ago.

By Mr. Wright :

Q. That would not apply to all things, would it ?
A. No. You see that when you sow wheat the leaves may be killed by frost, but the root is not, and as a result the roots take more strength and are ready for a bigger growth afterwards.

By Mr. Stephens :

Q. Does it have that effect in Ontario ?
A. Yes, sir. 'The fool farmer' that doesn't put in his grain in the cold weather when the ground is fit will get caught. Should rains come and the ground be soaked he must wait for fair weather, while his neighbour's crop is growing.

By the Chairman :

Q. As a result of twenty years' experience in the North-west, I may say that wheat is benefited by the June frosts, while oats and barley are both injured, more or less.
A. I was satisfied about wheat, and now I know about oats and barley.

By Mr. Wright :

Q. Does not that apply to pease as well ?
A. I do not know anything about pease. Beans would be thoroughly killed. I am very glad to have the information which the chairman has given me about oats and barley. I am glad to be corrected, because my main point is to get at the absolute truth. Now, then, here is the point I want to make in this matter. The light rainfall gives clear sunshine, and the frost not only gives constant moisture to the roots of the plant, but you can see that the want of the vertical rays of the sun prevents much evaporation. Because, as you know, there is not nearly as much evaporation where the sun strikes diagonally as when it strikes perpendicularly, as it does here when the summer comes. So that the conditions of frost, moisture and sunshine are just suited to bring forth this wonderful growth that I found constantly at Dawson.

Allow me to make another remark, as I find that I am with gentlemen who can correct me if I am wrong. I am a believer in the arid land of our North-west, as a permanent land for settlement, and here is my reason : Wherever the rainfall is light there is no leaching of the land.

By Mr. Wright :

Q. Hear, hear. Is that a fact ?
A. Yes, that is an absolute fact. Now you see you get land that is arid or semi-arid and you get enough water on it to make growth, and then you have a permanently rich land, because there is nothing washed out of the soil. In Ontario where the rainfall is great and the drainage is large you have to keep the land up by artificial means or it will run out. I will give you an illustration. British Columbia west of the coast range will not produce as good crops now as it did thirty years ago, and without manure the soil produces very little. The reason for this is very plain. The constant rainfall takes everything out of the soil, rich land though it is. The arid soil does not leach in the same manner, and therefore it is permanently good. Where the rainfall is very heavy and leaching consequently takes place it runs out.

By Mr. Thompson (Grey) :

Q. Does that apply to anywhere on the coast ?
A. It applies to anywhere on the coast west of the Coast range.

Q. Do they find the same result in Great Britain as in British Columbia ?

A. They do, for this reason, you never heard an English farmer that did not tell you about feeding the land. Why, you know, the English farmer lays out more money to manure his land by costly manures from one part of the world or the other than we would give to buy it. That is true, and that is the meaning of it.

By Mr. Robinson (Elgin):

Q. That is, these arid lands are fertile ?

A. Certainly.

Q. How do you propose to make them produce crops ?

A. By irrigation.

But the trouble is that we do not go deep enough; we do not look deep enough. All these lands are deep, and they hold out so well simply because there is nothing taken off. I want to apply this to the Yukon. There has never been leaching in the Yukon. As I said there has never been a glacier, and the rocks there are decomposed and may be changed a little, but all the valuable ingredients belonging to the soil are there.

By Mr. Wright :

Q. The accumulation of ages ?

A. The accumulation of ages. The gold in that country, as any one can see with half an eye, never went five miles, or ever went one mile, as there is no glacial action and no leaching. But I am not speaking of gold; that is an inadvertence, and I have not said a word about gold.

Q. How would you propose to make that arid region fertile ?

A. By irrigation.

THE CHAIRMAN.—The government spend a large amount of money in that way.

THE WITNESS.—During the visit of the British Association to Canada some years ago a rather interesting illustration of their fertility took place in these very arid lands. At that time the conditions were very bad near Medicine Hat. The railway had just been built that year or the year before, and near Medicine Hat I descended from the train and pulled a big tuft of oats. I think there were about thirty stalks in the tuft, growing alongside the track where grain had fallen. I went to the end of the car—there were seven Pullmans on the train—and went through the train and said: 'Gentlemen behold the products of the desert.' These oats were 30 inches in height in all stages, and there were about forty professors on board, and I need not tell you I gave them lessons they never forgot. That was a revelation to them. Two years before that the revelation had come to me in the same way. I found that there was some cause for this wonderful growth, and I could not make it out, but I am satisfied that the statement I made at the first is correct.

By Mr. Cochrane :

Q. What would be the difference in leaching of the soil between the natural rainfall and irrigation ?

A. That, perhaps, requires a man of more ability than I have to answer. But I can tell you what I do not believe in, that is what they are doing in British Columbia. Here is a land under a temperature of 100°, and I have seen them run water that came down off the mountains, ice cold, on to that land, and I do not consider that very wise. I dared not tell them that. If I had done so I would have had trouble, but I mark down, 'you don't know your business.' I believe that if the water is fairly warm it is just as good as if it came down from Heaven.

Q. You don't catch the idea. I want to find what would be the difference taking waters of the same temperature. You say the rainfall leaches. Why would not irrigation have the same effect in leaching ?

Q. There is no leaching on land if you do not saturate it. If you saturate the land it is common sense to suppose that leaching will take place. Oh, I see the point you make, and it is just the crux of the matter. The man who irrigates his land too much is a fool.

Mr. COCHRANE.—He does not know that until he is told.

SPECIMENS OF CEREALS FROM THE YUKON.

THE WITNESS.—Now, here is a specimen of what I was saying in reference to the vegetation in the Yukon. I went across from Dawson up to where a man named Munro had about 25 acres of oats last year. I got this specimen, which I now produce, growing in his field on the 6th of August. You may notice it is coloured and beginning to ripen.

By Mr. Robinson :

Q. How near Dawson ?

A. I think two miles from Dawson, only across the river.

By Mr. Wilson :

Q. I think you said it is used simply for feed and not for the grain ?

A. Oh, yes, I will mention that when I show the specimen. Here is barley on the 6th of August. I have some wheat that I cut on the 6th of August, but in the meantime I will show you this mixed wheat and barley and oats which I cut. I cut this in the same field on the 23rd of August. This man just got the seed from California; I will say California, it may have been Seattle or Victoria, or somewhere on the west coast. The seed consisted of wheat of two or three kinds, barley and oats. He cut it for fodder—they cut their fodder last year from the 18th, and it was all cut on the 23rd, from the 18th to the 23rd. This was cut on the 23rd, when they were cutting the oats for fodder.

By Mr. McEwen :

Q. Is that the full length ?

A. No, it would be considerably longer. You need not worry about the length. It depends altogether on the condition of the field. It might not be more than thirty inches and it might be four feet. I found where the soil was broken the second year a little bit of it had been broken the year before, and it might be called a fair crop, and it is nothing extraordinary as regards the size of the stock or anything; but you may notice there is no want of vigour in it. You will see the firmness and strength of this (producing specimen). I did not take it for the purpose of showing much of it, but I believe it is a fair specimen. Now this barley had been sown at the same time. That barley I pulled out of the field just when they were cutting it. That was sown on the 5th of June. From my standpoint it should have been sown a great deal earlier. It should have been sown as soon as the snow went off the ground. You see that is right.

By Mr. McEwen :

Q. That is the full length ?

A. That is the full length; that is ripe.

Now, that is some of the wheat I pulled out of the field. If there is any gentleman here from British Columbia he will recognize the head, because I have seen it in the oat fields around Vancouver. It belongs to the crop. At any rate what I wanted to show was this, that it was not ripe when I cut it. I do not pretend it was ripe, but it was ripe enough to bring. That was on the 23rd of August. I came home, and when I opened it out I was reminded of the time when I was a boy, when we cut wheat with the shearing hook and the cradle and started in early, and did not wait until it was ripe as we do now, and let it ripen in the stook. This had ripened in the packet. When

I came here and got Mr. Stupart's work I was writing my report to the government. I said, the next thing I will do will be to send some of this wheat to the Experimental Farm, and I took a couple of heads and sent them to the experimentalist there who has charge of the seed germinating process, and he sent me the report that he had planted one hundred grains. The whole hundred grains grew and made a remarkably vigorous growth; in other words, there was not a weak seed in the lot, and there was not a failure, and what was more they vegetated very quickly.

By Mr. Wright :

Q. You don't know when that was sown ?

A. On the 5th June. That is, this sample was got from one field, where fall wheat, spring wheat, oats and barley were growing together for fodder.

Q. They mixed them all together ?

A. Yes. Up there they swear some. This man swore when I pulled up this (showing leaves and roots of fall wheat), and said, with an innocent looking face: 'What in the world is that ?' He said: 'That is fall wheat. I wanted to get oats and spring wheat, but half of this grain has turned out to be fall wheat,' and that is one of the specimens. Now, gentlemen, you see these stems. You are afraid the growth of the grain is not much. You see how thick these stems are; that is one of the native grasses of the country. There are about half a dozen species of that genus ; it is called *arctagrostis.*

PASTURE GRASSES AND FORESTS.

One of our pasture grasses here is called *agrostis.* That is the northern type of it; see how thick it is. There are half a dozen species of that, which grow in the valleys and on the hillsides, and as soon as the country is opened and it gets scope this will spread itself and be a fine grass on the hillsides. In fact it is there now. So the matter of native grasses is sure. I got more than fifty species of grass around Dawson. Another thing that struck me as more remarkable than anything else: I did not see a weed at Dawson that did not grow with the utmost vigour. It was wonderful.

By Mr. Richardson :

Q. You say when it gets scope; what do you mean by that?

A. When the forest is off. When the white man first went there there was only a little bleak place here and there. Now the forests are beginning to come off, owing to being cut down for timber for mining and building purposes, and also through the occurrence of fires.

Q. The country is largely covered with forest ?

A. Largely covered with forest such as it is.

By Mr. Wright :

Q. When a fire burns over a forest there it will not burn off the virgin soil ?

A. No, because there is no time for stuff to rot. There is time for stuff to decompose, but rotting is not in it.

Q. Here in eastern Canada fire would burn the vegetation ?

A. Yes. But there is not anything like rotting there, as we understand it, because it rushes into summer, and when the night lengthens the cold strikes it.

Q. You think there would be no difficulty in ripening wheat in the Yukon ?

A. When I came home I said there was nothing doubtful but wheat. Since I came home I say there is nothing doubtful about wheat.

By Mr. Robinson (Elgin) :

Q. What is the feeding quality of that grass ?

A. I do not know myself, but gentlemen there said it kept their horses fat and strong. Would you repeat your question, Mr. Wright ?

APPENDIX No 2

GROWING OF WHEAT IN THE YUKON AND IN THE NORTH-WEST.

By Mr. Wright :

Q. You think there would be no difficulty in ripening wheat in the Yukon ?

A. Here is what has always been a puzzle to me. I was at Edmonton 31 years ago. You could scarcely ripen wheat there; in fact when I left on the 7th of September the wheat was about three-quarters of it, one-half anyway, smut, and the farmers said that they doubted whether it would ripen or not, and I wrote in my note book that it would not ripen. That is 30 years ago last August. Twenty years ago one used to hear a great deal of talk from the people around Winnipeg and the sections of the west then settled that there was so much frost, but you remark there is not any talk about frost now. Here is a question I want to ask farmers there. Does the wheat not ripen earlier than it did when you went there ?

By the Chairman :

Q. No.

A. I say it does.

By Mr. Wright :

Q. It becomes acclimatized. We have grown early pease for the American market. You take a bag of seed down to Maryland and sow it, and the other half take up, say, to Illinois. The pease I sow this year will become acclimatized, and the next year I will take them down to Maryland and they will ripen two weeks earlier than theirs. We can get $5 a bushel more than theirs for that reason.

A. Now you give me the whole question I was coming at. That was the wonder to me, why our people won't see these things, especially the North-west men. Now, here they have been growing wheat in the North-west for 25 years. What I wanted to show was that this Red Fife we are sowing now had got acclimatized and was ripening earlier than it did in the early times.

By the Chairman :

Q. We have been growing wheat for 20 years in the North-west, and claim to know a little about it. My own impression is that the professor is a little astray. I do not think the wheat ripens earlier, but the farmers cut it earlier. They do not wait till it changes colour. They get wheat which is not so plump, but it contains the same amount of gluten, and is equally valuable to the market, but is not as fine a sample. Well, that is one reason why we do not hear so much about frost. Last year I went through a large section up in my own district, and saw grain cut that would not pay for drawing. It was totally useless, utterly destroyed by frost, and that was only last season, when we had such a wonderful crop; but in the large district of country reaching all the way from Qu'Appelle valley down to near Moosomin the crop was totally useless. You cannot tell where the frost may strike. There the frost passed through that country in that way, and it is exceedingly difficult for any one to go in and settle successfully. You have to know the country before you can make it a success. You do not know all about the frosts in the North-west, gentlemen, and it does not always get into the papers because the farmers do not want to say too much about it. Four miles north of that district is my own province, and a finer crop of grain than we had last year I never saw in my life. It was perfectly matured. I am here prepared to say, after 20 years of experience, that I never lost a dollar by frost in that country, simply because we are on high rolling land, and on the north bank. I cannot say that our wheat matured earlier. I cannot say that our wheat matured earlier, but wherever people in that country experienced a difficulty with frost if they will sow earlier they will lose no wheat; certainly they will manage perhaps to get their grain off without frost.

By Mr. Wright :

Q. Do these cold waves follow the same route ?

THE CHAIRMAN.—No one can tell what route they will follow.

THE WITNESS.—I know the country that you are speaking of, and in 1879 when I passed through that country north of Qu'Appelle I lectured in Winnipeg to about a thousand people, and I told them that there were 8,000,000 acres of land almost at their door fit for settlement, and no one seemed to know it. I can see the tract of country you speak of as being frosty, and it is a springy country; it is a country with cold subsoil, and you can depend upon it that any country with a cold subsoil is liable to frost.

Now we will leave that. I am glad that the North-west farmers are not as bad as I thought. I did not believe they were; I only wanted to strengthen my own opinion, and I have done so. There is not a wheat field in the North-west where grain does not ripen, some of it a little earlier, where some heads would not ripen a little earlier than some others. How easy it would be to take these heads that ripen a little earlier and use them for seed, and so extend their growth farther north by means of this. That is what I want to get at. Now Edmonton is the centre of a wheat growing district, and 31 years ago from my standpoint it was unfit for it.

By Mr. Cochrane :

Q. Before you leave that subject, does not the condition of the soil affect the wheat growth ?

A. It is the aeration of the soil and the inclination of the land to the south that gives you freedom from the frost. The reverse is the case if you have it on the other side of the valley; where you have an inclination to the north there is chilliness. You were wise in your day and generation, Mr. Chairman, in taking land with a southern aspect.

THE CHAIRMAN.—From my experience in the North-west and in Manitoba I would say that what you regard as the most favouable condition for good farming is land with a southern aspect. As a general thing we look for the north and the north-west; we would rather have an inclination to the north and the north-west. If we get protection from the frost it is where you have the land lying exposed to the current of air which keeps it moving, and in that way there is less danger of frost, so that a southern inclination may be dangerous and the northern inclination is safe.

A REVELATION AS TO AVAILABLE AREA FOR CULTIVATION.

By Mr. Wright :

Q. If you have a northern slope you do not get the sun's scald on the bark of the trees, but if you plant it on the south slope, where nearly everybody does, you will ruin your orchard.

A. In planting orchards in the west that is the way they must be planted—on the north side and not the south—but I do not want to go into that, because if I do I will get off my subject. What I want to do is to prove that 30 years ago I did not believe wheat would ripen at Edmonton from what I saw there, and I left there in September. Now this wheat (showing a sample) was grown in the Yellow Head Pass, 150 miles north-west of Edmonton, four years ago last fall.

By Mr. Wright :

Q. 150 miles north-west of Edmonton ?

A. Yes. This is from the Yellowhead Pass. Now, the reason I brought this up, gentlemen, is to show you this, that according to my standpoint 31 years ago, that Edmonton was outside where you could raise wheat with safety. Now, here is grain

raised up in the mountains, 150 miles north-west. Now, the Peace river country has been spoken of as unfitted for wheat-raising by some parties. I tell you, the Peace river country is well fitted, in fact, I reported the same year I was at Edmonton that the land in the Peace river country was better, and better suited for grain, than the Edmonton district. I wrote that 31 years ago, and it is true yet. Now, you will be considering railway matters. I am the discoverer of that Pine Pass, away up on the Peace river. I discovered it 31 years ago. Beyond that pass you begin to descend to the Pacific Ocean, and along there through that part of the interior of British Columbia, I tell you, gentlemen, the day is coming when they will be growing any amount of grain up there, and away up into the Yukon. In my report on the Yukon, that is just now being printed, I have added 100,000,000 acres more to our available land for settlement than I could have 25 years ago, because our people are prepared now to believe it. I might talk about a great many other things, but I think I am tiring you. Now, if you have any particular questions to ask me, I would be glad to reply to them.

GROWTH OF SMALL FRUITS AND VEGETABLES.

By Mr. Wright :

Q. I understand that blueberries in the Yukon are sour and not sweet, Is that so?

A. There are blueberries and blueberries. You have currants that are of two varieties. One would be sweet and the other sour. The Yukon blueberry is not the blueberry we have here. The blueberry we have here is *vaccinium canadense,* and *vaccinium Pennsylvanicum,* but what they have there is the *vaccinium uliginosum.* Of course it is a very good berry, but not so sweet. Now, at Dawson I saw acres of wild red currants. If any gentlemen are here who have been in Dawson they will perhaps remember where it was. I just sneaked there. It was in lower town, across the bridge, a rather naughty place for an old gentleman. Now, the red currants were on a hillside which was completely covered, and the currants were sweeter than ours.

By Mr. Cochrane :

Q. Was it forbidden fruit ?

A. That is the meaning of the berries not being sweet. This year there were a great many more raspberries than before, quite a number of them, but the blueberries and the black and red currents were an immense quantity, and those blueberries covered the hills. They were a great crop. There is one thing I might mention now about the growth in the creeks, but it is outside the scope of my talk. This is just one plant I brought to show you. It is called by the farmers on the prairie the crocus. That plant was gathered at Fort Yukon, at the junction of the Pelly and Lewes rivers, on the 24th of April, 1899, and I may as well tell you that particular species flowered on the farm two days ago (April 15th), and we call this an early spring here. This was gathered in latitude 62½ on the 24th of April, 1899.

MR. WRIGHT.—Almost as early as here.

By Mr. Robinson (Elgin) :

Q. Are most of the small fruits plentiful there ?

A. I have written in my notes that all kinds of small fruits would grow there, and I think, indeed, the Siberian crab will succeed there. As regards vegetables, you have no conception of them at all from seeing them here. I saw a cabbage on the 23rd of August weighing nine pounds, and I took the leaves, great oblong leaves, at the base, and I measured them, and each one was two of my feet, 22 inches, across, and you can understand what a garden would be like with cabbage each covering an area of four feet. They told me that turnips and the late cabbage grow far better when it gets

dark. They don't do so well in the summer as when the nights come, and in the latter part of August and September they do best.

By Mr. Sherritt :

Q. Did you say that apples grow there ?
A. I believe they will.

By Mr. Stephens :

Q. What about beans ?
A. I have white beans here. There are some first-class beans which I got there. They can grow everything, pease, beans, potatoes. Potatoes are the poorest things that they grow up to the present, but I told them it was because they got miserable seed on the west coast.

By Mr. Thomson (Grey) :

Q. It will not be a suitable country for the Irish ?
A. Oh, there is whisky there, and they are going to raise barley there, and there may be some whisky that would not pay any duty, and then it would be Scotch whisky.
Q. About frost. There must be something in the cultivation of the soil that would prevent that. Perhaps forty or fifty years ago there were two or three seasons when the settlers near the Georgian Bay thought they would have to leave the country on account of June frosts, but of late years we never hear of such a thing. Would that not be the cultivation ?
A. Yes, the clearing of the land and the letting in of the winds into the country to make a better circulation of the air. I remember that 30 miles back of Lake Ontario they did not consider that wheat was even certain. Now I am speaking of Seymour township, one of your townships, Mr. Cochrane. That is where I had the honour of holding forth in the early part of my life.

By Mr. Stephens :

Q. Have you any experience with under-draining—tile draining ?
A. No.

By Mr. Wright :

Q. Judge Craig of the Yukon told me the finest tomatoes he ever ate were in the Yukon; that they had a better flavour there than here.
A. He had been eating canned tomatoes for a year before he got them. That is probably the reason the flavour was so good.

Having read the above transcript of my evidence, I find it correct.

JOHN MACOUN,
Assistant Director and Naturalist of the
Geological Survey of Canada.

DRAINAGE OF FARM LANDS

HOUSE OF COMMONS,
COMMITTEE ROOM No. 34,
Thursday, May 7, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 11 o'clock a.m., Mr. Douglas, Chairman, presiding.

The committee met to hear evidence on the advisability of tile draining, the methods adopted and the probable cost, and the result of tile drainage on crops.

Mr. HENRY STEPHENS, Chatham, Ont., was present by request of the committee, and made the following statement :—

Mr. Chairman and Gentlemen,—You are no doubt all well aware that farmers are not, as a rule, public speakers. However, we feel that life is too short to learn too many things. When a man learns to farm, and farms well, we consider him to be a success.

DRAINAGE,—COST OF TILES AND DITCHES.

I have had some little experience in tile draining, and any question you gentlemen see fit to ask me I will try to answer. There is a great difference in localities as to tile drainage. In some places you require to lay the drains a good deal closer than in other places. In our country, down there in Kent, we have the best of land, and land that was no use whatever before it was drained is now the best land we have to-day, and raises heavier crops. I have a drained field myself where I think I got the money back on the first crop. I commenced draining in 1882. At that time we had to draw our tile 15 miles, and we paid for 6-inch tile $40 a thousand at the yard. We can get them now at our own doors at $26 a thousand.

By Mr. Kidd :

Q. That is for 6-inch tile ?
A. For 6-inch tile we pay $26 a thousand.

By Mr. Ross (Ontario) :

Q. They are made there ?
A. Yes.
Q. What is the cost per acre of draining in your section ?
A. It depends altogether on how much draining you can do.

By Mr. Kidd :

Q. What is the soil on your farm ?
A. It is a clay soil.
Q. It is not a hard clay ?
A. No, it is porous gray clay.

By Mr. Loy :

Q. How deep do you make your drains ?
A. From three feet and a half to four feet.
Q. How far does the frost go down ?
A. Only about three feet, seldom more than that.

By Mr. Ross (Ontario) :

Q. Your country is entirely flat ?
A. Pretty much flat.
Q. Have you main ditches there ?
A. Yes, we have main ditches for outlets.
Q. To which you drain ?
A. To which we drain.

By Mr. Kidd :

Q. They are open ditches ?
A. Yes.
Q. They are open ?
A. Yes.

By Mr. Stephens :

Q. How far apart do you put the tile drains ?
A. Twenty rods. In some lands we find certain ravines, and we calculate to follow them. That is the lowest part of the field, and if we can get down three feet or three and a half feet in that part we do not require to get very close to another drain. A drain three feet and a half deep will drain 20 rods in that way nicely.

By Mr. Schell :

Q. Twenty rods on each side ?
A. No, twenty rods to the drain.

Mr. Ross (Ontario) :

Q. Are these public ditches that you spoke of just now ?
A. They are ditches constructed under the Ditches and Water Courses Act.
Q. By the municipalities ?
A. Yes.
Q. And kept in order by them ?
A. Yes.

By Mr. Robinson (Elgin) :

Q. All of yours are not constructed by the municipalities ?
A. Not all of them.

By Mr. Stephens :

Q. The majority are ?
A. Yes.
Q. Which are kept by the municipalities, are they not ?
A. Yes.

By Mr. Ross (Ontario) :

Q. It is their business to see they are kept clear ?
A. Yes, but the men who own the land pay the bill in taxes.
Q. They do ?

A. Yes. The engineer comes along, if a drain needs clearing out, he takes the levels and has the job done and charges it to the farmer.

By Mr. Broder :

Q. That is, the municipalities ?
A. Yes.
Q. That is done under the council ?
A. Yes.

By Mr. Kidd :

Q. You dig by hand ?
A. Usually by hand.

By Mr. Broder :

Q. You are supposed to get the tiles level on the bottom ?
A. Yes, you have to have them level on the bottom. We think the best time for tile draining is in the spring of the year, or late in the winter when we have water to give us the level. We think it is much better to drain in that way than undertake to do it in the summer time when the ground is dry. I used to drain a field every season, and I would put that field generally in beans.

By Mr. Ross (Ontario) :

Q. What size of a field ?
A. Twenty or twenty-five acres.

By Mr. Kidd :

Q. You would plant it in beans ?
A. Yes, in beans. You see beans do not require to be planted till about the middle of June, and that gives time to plough the land, and really summer-fallow it, before they go in, and we can run drains in and get that land ploughed before the middle of June.

By Mr. Broder :

Q. Of course, your experience of tile draining is that frost is less liable to strike the land; it is estimated that there are three degrees difference between tile-drained land and that which is not so drained, I am told ?
A. Well, in that kind of soil it is less liable to catch the frost. Usually we have black loam on top, about six inches deep, and under that gray clay for nine feet, and then you strike the quicksand.
Q. Nine feet of clay ?
A. Gray clay for nine feet, and then we have two feet of quicksand, and then blue clay running down to the rock perhaps 90 feet.
Q. Of course, the water would be a long time getting through that nine feet of gray clay ?
A. Yes.

By Mr. Stephens :

Q. Gray clay ?
A. Yes, gray clay on the surface. In digging we start at the outlet——

By Mr. Broder :

Q. Always ?
A. Always. We start at the outlet, as I have said, and we throw up the surface earth on one side and the earth from below we put on the other side of the excavation.

When we have laid the drain we fill in the earth from below first and the surface dirt next, so that it leaves the land as we found it.

DIMENSIONS OF TILES.

Q. You speak of 6-inch tile, what size do you use in the field ?

A. It depends on the amount of water. A 10-inch tile makes a grand outlet for your main drain.

Q. That would be an outlet for a large area ?

A. Yes, perhaps forty acres.

By Mr. Robinson (Elgin) :

Q. I suppose you used 3-inch tiles ordinarily ?

A. I would not advise any one to put in a small tile.

Q. But you would use the 3-inch through your field for small taps to the other drains ?

A. I would use more 6-inch than 3-inch.

Q. That is in your leading drains, but in your lateral drains ?

A. I would use 4-inch or 6-inch tile.

By Mr. Kidd :

Q. Do you cover them before laying the earth on ?

A. We lay them carefully. You want a careful man to do that work. If there are grooves you cannot get together tight, there are usually a few, you can take a broken bit of a larger tile and lay it over it. A broken bit of a 10-inch tile over a 6-inch or an 8-inch over a 4-inch you will find to fit over the groove nicely.

By Mr. Stephens :

Q. At the present time there is no 3-inch tile used in the county of Kent, is there ?

A. Only for taps or for a main drain when it runs for a very small distance. When it runs up to six or eight rods a 6-inch pipe is put in.

METHOD OF CONSTRUCTION.

Now, I have here a plan which is not drawn to scale, but which perhaps will show you the manner in which we construct the drains. You will observe that this is the open drain running along the bottom of the plan from 'A' to 'B.' Here at 'C' we start with a 10-inch drain, and we run this up about half the length of the field to 'D' and then with 8-inch tile we run it up about 60 rods more to 'E,' and then we take a 6-inch tile, which we run up to the end of the field at 'F.'

Then, you see we have here at 'G' the first tap, which is of 6-inch tile, and branching from that where there is likely a low place, we run a 4-inch tile there from 'H' to 'J.'

By Mr. Broder :

Q. That will be some troughy place in the field ?

A. Yes. A great many run their tile straight into the main drain. That is a mistake. You see when the water comes down here through these sloping laterals, it is running in the same direction as the main drain, so it enters into the stream and goes on, but if it run straight in it would create stagnation where it enters the drain. The first branch drain on this other side is a 6-inch, then comes a 5-inch on the other side, and there is a 4-inch. You see we are getting smaller tile as we get up the drain.

Q. With the smaller tile you have to put them in more frequently, that would be the only remedy ?

A. That would be the only remedy.

Instead of putting a porous tile at the end of this drain at 'C,' we put in a sewer pipe or glazed tile, which will stand the weather. With a porous tile here, the probabilities are that a year or two of frost will crumble this tile and give you trouble. It is necessary also to put some kind of screen over this tile at the outlet to keep things out. In this very drain I got a racoon in here (———). We saw the tracks along here (from 'B' to 'A'), and one day after a rain we saw the gentleman's track along here and he had entered the drain. He had been going in and out of there for perhaps a month. So we set a figure 4 here and caught the gentleman. If this screen had been on that would not have happened. I think sometimes that rabbits and ground hogs, which are more numerous than racoons, go in, and keep on going in, the drains where it is nice and cool in summer, but the drains get smaller as they get further up, and the animals get up so far it is impossible for them to turn and they die there, and that has a tendency to choke your drain. Now, with this tile coming in here I think, with a glazed tile, a 'T' or a 'Y' would make a better job.

Q. The ordinary porous tile has no opening. You have to break an opening ?

A. They make them now at the factory with holes in. If you want a 6-inch hole, they make it, but it is not so good as a 'T' or 'Y.' It always requires more or less tinkering and fixing up.

Q. You approve of the other tile ?

A. I think so ; for all the little expense there is it makes a better and safer job.

Q. It is not so apt to break ?

A. No. In running a long drain perhaps 150 rods, you would require a well here (), sunk down perhaps two feet below the bottom of the drain.

Q. Where ? At the end ?

A. No, up about a hundred rods. We do not use many of them, and they are hardly necessary unless it is a long drain. If you put a well down here (about a hundred yards from outlet) sink it down 1½ feet below the bottom of the tile, and then work it around. I have one or two that are covered with boiler plate, and I have them covered up. Then, I have measurements from a shade tree or some other mark, so that I can tell at any time where it is, and we are ploughing and cutting hay and wheat right over the well.

Q. What is the object of the well ?

A. To catch anything that comes down. There may be a little settling.

By Mr. Kidd :

Q. You have that right in the drain ?

A. Yes.

By Mr. Stephens :

Q. I thought the object was to have the raccons turn round ?

A. No doubt, it would be convenient for rabbits, ground hogs and coons.

By Mr. Erb :

Q. The wells are only necessary where the drains extend far, and where you have to catch seedlings and soil ?

A. Yes. You can go to it at any time to clean it, but perhaps once in five years is enough.

CROP ROTATION,—COST AND PROFIT.

By Mr. Broder :

Q. You run the tile in on that side and trap it out on the other ?

A. Yes.

I think that cost me about $600, and this plot contains about 25½ acres. That is, it cost $600 to drain it. The first year, in 1892, I had that field in beans, and I threshed 945 bushels, and I sold them at $1.35 per bushel, making a total of $1,275. I put $600 into it, and I calculated I had paid for my labour, paid for my drainage, and had something to the good for the first year.

Now, when the beans came off we cultivated up the ground and sowed it to wheat.

By Mr. Broder :

Q. Fall wheat ?

A. Fall wheat, and the next year it turned us about 22 bushels of wheat to the acre, not a very large yield. I seeded on the wheat to clover and timothy, and the next year I cut off the first crop early, about the 15th or 16th of June, and let the clover go to seed. I threshed that year 204 bushels of red clover off 55 acres, and I credited this field with 100 bushels of red clover. So you see we take off four crops with the one ploughing. There is only one ploughing required, and we frequently do that; put out the manure on our bean land and plough it either late in the fall or early in the spring. Then we go on in the spring and germinate everything that is there, so that when it is ready for beans it is clean. That enables us to take off the beans and put in the wheat.

By Mr. Stephens :

Q. In a great part of the country beans are not suitable to the climate and soil, and tile draining would not affect that ?

A. I do not know. I think drainage is necessary for all kinds of crops.

By Mr. Ross (Victoria) :

A. What is the result of raising grass, timothy and clover, with that ?

A. Lots of grass.

Q. Not after grass—but producing timothy and clover ?

A. I do not think it has any tendency to reduce the quantity, and I think it improves the quality ; I am sure of that. I have cut four tons of timothy per acre off land that was treated like that, thoroughly drained ; I baled it and weighed it right up, to see what it would make.

DIFFICULTIES FROM CERTAIN LOCAL OBSTACLES.

By Mr. Stephens :

Q. Are there any soils tile-draining is no use in ?

A. There are some soils it is pretty hard to use tile drains in. Where there is hardpan near the surface, or take a quicksand, if you strike quicksand it will run wherever water will run, and it is almost impossible to keep it out of your drains.

Q. Are there not some clays the water will not soak into ?

A. There are some.

By Mr. Ross (Ontario) :

Q. Which ones ?

A. There is some red clay and some blue clay, in which case the water will lie in the ditch till the sun dries it up.

Q. In that case tile is no use ?

A. No use whatever. In going through sand, in our experience, we strike a little knoll, where we get sand. In that case, I think the better plan would be to put in glazed tile.

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By Mr. Stephens :

Q. And cement the joints ?
A. And cement the joints. It is wonderful what sand will get into porous tile.

By Mr. Broder :

Q. At the joints ?
A. Where water will get in that sand will follow also.

By Mr. Stephens :

Q. Where there is a height of land do you go around or straight through ?
A. We use our judgment. Sometimes it is best to go around.
Q. You have to keep a fall ?
A. Yes.

DRAIN OUTLETS.

By Mr. Broder :

Q. Some men with experience tell us that it is a mistake to have the outlet too large, that it is well to have a small outlet and so have a pressure of water to flush out the drain ?

A. I think it best to have plenty of room at the outlet. I tell you, in the spring when we have a freshet it cleans out anything. You see in this plan I have here that drain runs up there and takes in all these tributaries, and in the spring, if you go down and examine the outlet, you will find it two-thirds full of water.

Q. Large farmers combine to get these main drains ?

A. They get up a petition to the council of the municipality of the township where a drain is required.

Q. I am speaking of your centre drain there ; if your next neighbour wanted to extend his drains, how would you do ?

A. Of course, you can work that proposition, but we don't work on that much on that theory ; your drain is independent.

Q. Suppose he had no other outlet ?

A. You can generally find an outlet if you look for it. We drain to the most convenient outlet. We drain here to this outlet and there to another. Our water falls to the west and south.

Q. It sometimes occurs that one neighbour has to get an outlet across his other neighbour's land ?

A. They can make an arrangement, of course, to that effect.

Q. It would be no harm letting him go through, it would help you ?

A. But generally it is the other way. Sometimes beneficial to both parties.

By Mr. Erb :

Q. Have you ever noticed that certain crops send roots down into the drains, that is, if they are not down deep ?

A. No. I have noticed roots of trees—soft maple is bad—I have noticed these roots go down and have taken them off to keep them out of the drain.

Q. I noticed in one of my fields last year large bunches of thread-like growth. I have a screen over the outlet such as you have spoken of, spikes in a wooden box, and this growth fogged up and closed the outlet.

A. How deep is your drain ?

Q. From 3½ feet to 4 feet deep, and in some places not more than a foot and a half.

By Mr. Robinson (Elgin) :

Q. You find the roots of these trees will choke the drain up ?

A. Yes, unless they are cut off.

By Mr. Kidd :

Q. They will grow faster, anyway ?
A. Yes.

By Mr. Robinson (Elgin) :

Q. Then, your advice is to cut down the trees ?
A. Yes.

By Mr. Broder :

Q. In what distance—20 feet ?
A. Yes.

DURATION OF DRAINS,—FALL IN WATER COURSE.

Q. What is your experience of the lasting of these drains ; from 20 to 25 years ?
A. Yes. You see, I commenced draining in 1882, and about 1887 or 1888 we got more out of our outlet—that gave us a better fall—and I put a drain along under some I had in before, and in taking them up I found they were just as clean as the day we put them in.
Q. They were good tile ?
A. Yes, hard burned tile.

By Mr. Robinson (Elgin) :

Q. You had a good fall ?
A. Yes, we had a nice fall, but it is surprising how much you can do with a little fall.

By Mr. Stephens :

Q. You could do it on a level if there was a pressure from above ?
A. Yes, the pressure from above would take it out.

By Mr. Broder :

Q. But it is better to have a reasonable fall.
A. Yes.
Q. Would you tell us what fall ?
A. Half an inch of fall to the rod, but I believe I have drains working successfully, that is for a certain distance, with even a less fall than that.
Q. The frost will not enter as far down with tile.
A. No, because the water is taken away, and the land becomes dry and not apt to freeze so deep.

By Mr. Stephens :

Q. In cultivating a field in the spring that is tile-drained and which you are grazing, is the land very much less dry ?
A. Yes, quite firm. You would know it quickly by walking over the ground. You can get on to it ten days before land not drained.

By Mr. Broder :

Q. Than ordinarily drained land ?
A. Yes.
Q. A dry soil is more porous and hence gets drainage, and it has better circulation in a wet season ?
A. Oh, yes.

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By Mr. Stephens :

Q. In a dry season, I am told, a field with tile will remain moist and loose and a field which is not tile drained will be hard.

A. Yes, it will stay loose where other ground, not drained, is hard and baked.

By Mr. Broder :

Q. Has it a tendency to carry away the manure ?

A. I do not think so.

By Mr. Stephens :

Q. Is it not the opposite ; does it not take anything out of the water that is in it ?

A. No doubt, in case of liquid manure.

Q. And enriches the soil ?

A. It enriches the soil.

Q. Which would be the effect by taking the liquid manure into the ground ?

A. Yes.

By Mr. Schell :

Q. The ground serves as a filter ?

A. Yes.

LIFE TIME OF DRAIN, DETAILS OF COST, AND HOW CONSTRUCTED.

Q. I might answer Mr. Broder's question. I know a farm at home that was tile drained 41 years ago and it is as efficient to-day apparently as it was then.

A. You see, I have some drains in the ground 21 years, apparently working as good as the day we put them in.

By Mr. Broder :

Q. Of course, the verdict of the people generally in the localities where you have drained is favourable to tile draining ?

A. Oh, yes. Now the cost per acre, I will give you what we can buy tile at down there. We buy 3-inch for $8 a thousand.

Q. Less than a cent apiece ?

A. A thousand feet.

Q. Will that lay a thousand feet ?

A. A thousand feet of tile will make 60 rods of drain; 3½-inch is worth 12½ cents per rod.

By Mr. Broder :

Q. The size of tile is measured on the outside ?

A. No, that is the bore size.

By Mr. Robinson :

Q. Do these prices include the cost of labour ?

A. We figured 25 cents a rod for labour ; 3½-inch tile costs 12½ cents for the tile per rod, and 25 cents for excavation, and that makes 37½ cents per rod.

By Mr. Loy :

Q. Isn't 25 cents per rod a low estimate ?

A. No, I do not think so. The drains are not very wide, you know. I generally put on a gang of three men ; two men who dig out the drain, except the last or bottom,

and one man going on with the last spading and putting the tile in as he goes. He stands on the last spading, and has a long scoop which is curved. He gets about 12 feet properly scooped out, and he makes a level bottom, a place where the round tile will just fit in, and he can tell if there is water running, exactly how to lay it. When there is water running, he will hardly ever have to make any changes in putting in his tile, he will be that careful and level that the tile will go in straight and accurately.

By Mr. Robinson :

Q. The scoop, I suppose, is about the size of the tile ?
A. About the size of the tile.

By Mr. Erb :

Q. Is the scoop shoved or is it drawn towards you ?
A. It is drawn towards you. Then the man does not have to go into the drain.
Q. I am using a scoop that shoves ?
A. We don't do that. We pull the scoop toward us.

By Mr. Schell :

Q. Is it a stony country ?
A. In our country you might dig for days and not find a stone.

Mr. Erb :

Q. I suppose the bottom cuts almost like cheese ?
A. Yes.
Q. Have you any experience with hard pan ?
A. No.

By Mr. Stephens :

Q. I suppose with hard pan it would be no use, if you do not get deep enough it would be no use.

A. The water would come in if your tile was below the hard pan or in it. The water would come to it through the top of the hard pan.

We buy 4-inch tile at $11, and at 17 cents per rod; the labour added makes it 42 cents per rod for draining.

We fill in very quickly. We take a long double-tree, and put a horse on each side of the drain after you get started, and have perhaps 6 inches of dirt on the drain. We prefer cutting the bank away down near the bottom of the drain. We get generally a better clay to put immediately on top of the tile, but after we get 4 inches on we go ahead and put anything we come to in.

By Mr. Erb :

Q. Do you cover with straw or anything ?
A. Not in clay land.

By Mr. Broder :

Q. Would you in sandy land ?
A. It if was too bad I would cover with paper.

By Mr. Stephens :

Q. Some use tar paper.

A. That would likely be a good idea. We just go to the yard and get a load of eight and nine and ten inch broken pieces; you can generally get all you want, or sometimes you can get them around your place. There are always some broken pieces which will

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fit closely around the joints of smaller tile. There is one thing that should never be done. You should never pile your tile on the ground. A great many people will go at it and get their tile out in the winter, and pile them where they think they are going to make the drain in the spring, and when that is done that bottom tier is spoiled altogether by the frost during the winter.

By Mr. Erb :

Q. That depends on the tile. I have had some lying for two winters.

A. We cannot do that down there in our country, but if you should put a board under them it will be all right. 6-inch is a good general purpose tile. It costs $25 at the yard.

By Mr. Broder :

Q. Do they make the 6-inch the same length as the smaller ones ?

A. The same length; all the same length, 12 inches or one foot long.

Q. It must make a strange looking tile ?

A. Sometimes I have seen them two feet long; but I would not advise any one to use them.

Q. They are harder to lay ?

A. They are much harder to lay. A foot is quite sufficient.

Q. That would be a larger outlay ?

A. Yes; this would cost you 62 cents a rod for your drain.

Q. You would put that in the centre of a field, say a 10 or 20 acre field ?

A. Yes.

Q. And run the fours and fives to it ?

A. Yes, run the 4-inch and 5-inch pipes to it.

By Mr. Erb :

Q. What is the cost of the 6-inch tile ?

A. $24 per thousand at the yard, which equals 60 rods of drain.

We have them there now ; we have a tile yard within 20 rods of my farm. I think it is a mistake for a man to rush in and try without any experience to do a lot of draining at one time. I found that as I went along I got experience, and made changes. I commenced draining in 1882, and I kept on until I now have 250 acres all thoroughly drained.

By Mr. Robinson :

Q. Did you do any of it with your own hands ?

A. Yes.

Q. That is, doing the practical work yourself ?

A. I have done all parts of it myself, taking out the bottom and putting the tile in. When I first started it was difficult to get a man who knew anything about it. I got a fellow and kept him as long as I could doing just that sort of business, viz., taking out the bottom spading and putting in the tile.

Q. You educated your man to do it ?

A. Yes, and he was a natural genius, and it would surprise you how tight and close he would get the tile.

By Mr. Stephens :

Q. Is it difficult now to find men ?

A. No, you can get them still. If the tile does not fit you can turn it until it does fit.

Q. And occasionally turning it round the other way, end for end ?

A. Yes. If you want to run your drain at a little curve you can manage it without trouble by carefully laying your tiles.

By Mr. Broder :

Q. Some are sprung ?

A. Yes, and you can easily get round a curve with them.

By Mr. Kidd :

Q. Have you any trouble with the fall ?

A. No. You are watching the water all the time as you lay your drain, and so long as you have it running from you it is all right.

Q. You can put in a barrel of water if there is none there, so as to find which way the fall is ?

A. No, there is generally water enough in spring or fall there to guide you.

By the Chairman :

Q. Is a tile with a flat side best or one perfectly round ?

A. The round tile is decidedly the best.

Q. Not like a barrel ?

A. We found them where we put them in with the flat side not to lie as well as the round tile.

Q. In Great Britain they make them with a flat side.

A. We prefer the round tile. For a 10-inch tile they charge you $60 a thousand at the yard. That would cost you 96 cents per rod for the tile, and with the digging and all your drain would cost you $1.21.

By Mr. Kidd :

Q. Per rod ?

A. Yes.

By Mr. Broder :

Q. That is a large drain ?

A. Yes; this size drain with proper fall will carry a large amount of water.

Q. You put these about 120 feet apart in your fields ?

A. Yes. We find holes made by the crawfish, where the water bubbles up.

Q. You are not far from the lake, are you ?

A. We are 15 miles.

Q. That was lake bottom one time where you people live.

By Mr. Erb :

Q. We find crawfish in our fields, and we are 50 or 60 miles off from the lake.

A. Crawfish are great fellows to take water from part to part. Angle worms have a tendency to assist in draining.

Q. They are drainers, and they replenish the soil, too.

A. I am taking up too much time I am afraid. Mr. MacIntyre has to follow me. We have land that before it was drained was not worth $40 an acre. To-day drained land with thorough buildings on it is worth $80 an acre.

By Mr. Richardson :

Q. How much ?

A. $80 an acre. We have farms that have changed hands lately in our locality, and brought $80 an acre.

APPENDIX No. 2

By Mr. Broder :

Q. Your experience is that it is wise not to drain too much at once ?
A. Yes.

By Mr. Robinson (Elgin):

Q. You said you did a field every year ?
A. Yes, that is the way we did it. I was fifteen years in getting in the tile I have on 250 acres.

By Mr. Broder :

Q. I think farmers would have to get a man who understood it to show them how it should be done ?
A. Sometimes we go to the council and get them to give us the tile along the concession roads, and we go and draw them.
Q. That is for the outlet ?
A. That is, we go on and drain the farm to that tile outlet.
Q. But you always want to have a good outlet ?
A. Yes.
Q. It is no use without ?
A. No use without an outlet.
Q. The outlet is generally deeper than the main drains ?
A. Take this drain here on my plan; it is 4 feet deep. In starting that we have to go down just about level with the outlet.
Q. You always start at the outlet and go up ?
A. Yes.

By Mr. Loy :

Q. Your experience is with clay land ?
A. Principally ; we have some loam.
Q. Would you recommend tile draining where you have two or three different kinds of soil ?
A. Yes. If I got into a field where there was different kinds of soil, I would continue. I certainly would drain it.
Q. Would there not be a difference in the heaving of the soil in the spring which might cause the tile to break ?
A. We never found any difficulty in that respect.
Q. Unless put to a considerable depth ?
A. You must go down three feet to be sure you are below the frost.

BENEFICIAL EFFECTS OF DRAINAGE.

By Mr. Broder :

Q. Your experience is that grain does not rust as frequently on drained soil ?
A. Certainly not. We find we have it earlier too.
Q. You sow it earlier ?
A. It is possible to sow it earlier, and we also harvest it earlier. It matures earlier.
Q. It is pretty generally done in your country there by farmers ?
A. Yes. When I commenced in 1882, there was not a farmer had any tile draining. I planted a field of beans of ten acres and the beans came up all right at the beginning. Then came down a freshet. I went out in the morning, one day, and found the beans standing in water, and when I saw that I thought it was time that something was done. I got two men and we commenced digging in the ditches to drain water off the land, and then I went out to the tile yard, 15 miles away, and brought in tiles, put them in the drains, and I had a pretty fair crop of beans.

By the Chairman :

Q. May I ask what bean you grow in your country ?

A. The small bean ; generally known as Pea Beans.

Q. The Kidney Bean ?

A. What we call pea beans. They are the most profitable, and they are stiff in the straw, and stand up, and in case of a rain do not open and become wasted like the larger bean. You take a larger bean, you know how it takes in a lot of water when it rains, and the pods burst, and the beans are on the ground. If you take the pea bean, they do not open and waste in that way.

By Mr. Broder :

Q. And they do not discolour ?

A. No.

Q. Is your experience that any one crop does better where you have tile drains, or does it benefit all ?

A. It benefits all.

Q. How about corn ?

A. Corn requires drainage.

By Mr. Wright :

Q. When you commenced had the main open drains been started ?

A. Yes. You take corn, and you find that it is greatly benefited by tile drainage. Corn is a great crop with us ; we do not think anything of putting in 100 acres. I have grown myself 50 acres of beans.

By Mr. Broder :

Q. The market is not so brisk for beans, now ?

A. Yes, but last year my neighbours sold beans for $1.78.

Q. It was an exceptional year ?

Q. I have sold beans for $2.25 ; that was the most I ever got and I have sold them as low as 70 cents; and thought I made money, even at that low price.

By Mr. Robinson (Elgin) :

Q. You were a pioneer in tile draining in your part of the country ?

A. Yes, I was to a certain extent.

Q. Were your neighbours doubtful of the success of your experiment ?

A. Not after they saw results.

Q. They were not doubtful when they saw what you were doing ?

A. They were suspicious at first that I was going to waste my money, but not after they saw the result of tile draining on the fields that I put the drains in.

Q. They are all tile drainers now ?

A. Yes, now they are all tile drainers.

Having read over the preceding transcript of my evidence before the Select Standing Committee on Agriculture and Colonization, I find it correct.

HENRY STEPHENS,

Farmer, Chatham, Ontario.

APPENDIX No. 2

Mr. DAVID M. MACINTYRE, Paisley, Ontario, was also present by citation, and examined as follows :—

THE WITNESS.—As Mr. Stephens has said, he is a pioneer in this business of tile drainage in his section of the country, I may say that I have somewhat the same honour in my county.

By Mr. Stephens :

Q. What county is that ?
A. Bruce county, Ontario.

By Mr. Robinson (Elgin) :

Q. What part of the county ?
A. The township of Elderslie, lot 11, in the 4th concession.

By Mr. Stephens :

Q. What kind of soil have you in your township ?
A. All kinds. I might say that the district in which I live is a rolling district, very different I should judge from that from which Mr. Stephens comes from, and its necessities are also different. I am not a speaker, and I would like to know just what you want to ascertain from me.

By Mr. Robinson (Elgin):

Q. You heard what Mr. Stephens said ?
A. Yes.
Q. Is that approximately correct, do you think ?
A. I do certainly.
Q. Do you follow the same plan ?
A. I am in a different kind of country.

By Mr. Kidd :

Q. Is your high ground springy ?
A. The high ground on the farm on which I am has a number of ponds.
Q. It is springy ?
A. It is not springy; it is a high ground. It has a quick sand bottom and a clay subsoil.

By Mr. Stephens :

Q. And there are ponds on these hills ?
A. There are frog ponds on the height of land.
THE CHAIRMAN.—Ponds that hold the water ?

WOODEN BOX DRAINS,—DITCH.

THE WITNESS.—The draining in our country is not done on the same principle exactly as in the country that you have been hearing about this morning. Draining, I would judge, is not as requisite with us as it is there. We can grow fair crops in our country without drainage. Of course, as I told you, the soil on my farm is rolling. It is now about 25 years since my father started draining in this high land, and there

was no tile at that time, and lumber was put in ; hemlock lumber was there in abundance, and it was used in these drains, and they are working to-day. Hemlock 1-inch lumber was used for the bottom and top, and 1½-inch for the sides.

By Mr. Broder :

Q. How deep were your drains made ?

A. In some places on the height of land between the ponds and below them they might be four feet deep, and in the ponds they would be quite shallow, and sometimes we filled the ponds a little.

By Mr. Stephens :

Q. How would the water get into the drain through the board ?

A. We made a few incisions in the sides. We took the saw and cut the sides half way down and the water seems to get in.

By Mr. Broder :

Q. Through the curf of the saw ?

A. Through the sides we cut down a couple of inches.

By Mr. Kidd :

Q. Through the board of this pipe ?

A. Through the board of this pipe.

Often we would run through four or five or six or even more rods of quicksand at a time.

GETTING THROUGH QUICKSANDS.

By Mr. Stephens:

Q. And the quicksand ran in ?

A. There is sometimes a great deal of difficulty digging where quicksand occurs. In fact in a great many places we used a narrow three-inch board. When we got a bottom we laid down the board and placed the tile on it. That of course is after we started to tile the drains, but this drain of which I have been speaking, is not a tile drain. Then we got some straw or if it were in sod we were draining we got sod to put immediately on the tile in order to prevent the quicksand from working in. These drains are also working although these tile drains have been some of them in use for 22 years. For the past 22 years I have been putting in more or less tile draining, and they are all working. A few of them where the plough may have touched them in completing a furrow, have had to be repaired. I would judge, speaking generally in the country I come from, that from 16 to 20 rods of draining on an average per acre would fairly well drain a farm, that is 16 or 20 per acre, or 160 or 200 rods of drain on a ten acre field.

By Mr. STEPHENS.—That would be no use with us at all.

No question to answer.

CONFORMATION OF LAND,—DETAILS OF COST OF DRAINS.

By Mr. Broder :

Q. That is in a rolling land.

A. Practically a rolling land. We had a few swamps where the councils have run large ditches through, but these swamps are not very much cultivated yet. There is no difficulty in regard to the outlets on the rolling land.

APPENDIX No 2

By Mr. Broder :

Q. They are largely muck fields ?

A. There is a large part of that land yet. There is no necessity of my speaking of it here, because the land is not brought under cultivation.

By Mr. Stephens :

Q. Have you found the tiling in that sort of soil and rolling land is profitable ?

A. Oh, yes.

By Mr. Kidd :

Q. Is this rolling land stony ?

A. No.

By Mr. Robinson (Essex) :

Q. How does the cost of tiling compare with what it is in Essex ?

A. The cost is as follows : We make from 2-inch up to 8-inch tile, none larger than that is made in our yard.

By Mr. Stephens :

Q. Two-inch is not sold with us ?

A. The prices are, 2-inch, $7 ; 2½-inch, $8 ; 3-inch, $10 ; 4-inch, $15 ; 5-inch, $25 ; 6-inch, $30 ; and 8-inch, $50.

By Mr. Broder :

Q. They run up high on the 8-inch ?

A. The 8-inch is $50, yes.

By Mr. Robinson :

Q. That little 2-inch I suppose you run up in the hills.

A. I have never laid any 2-inch tile.

By Mr. Stephens :

Q. You would not recommend anything smaller than 4-inch ?

A. For a small drain 2-inch may be all right. I believe there is more 3-inch tile used than any other in our country.

By Mr. Kidd :

Q. That is for the tributaries ?

A. About every mile and a half or so there is a roll, and a stream, or if there is not a stream there has been one sometime, and that gives an outlet.

By Mr. Stephens :

Q. You would recommend larger tile as a rule ?

A. As long as the water from an unusually heavy rain gets away in 12 hours, I should think it was all right.

Q. Have you any experience with the small tile clogging up ?

A. No, I have plenty of clay, a heavy clay soil. We find difficulty in getting labour for draining, that is, we cannot get men who are experienced in draining. I do not know a man at the present time who makes a business of digging ditches.

By Mr. Kidd :

Q. It is not a nice job, and I suppose the boys do not like to go at it.

A. When we drain now we usually do it about this time of the year, as soon as we get the spring crop in we drain the root and corn land.

By Mr. STEPHENS.—If it should happen that farmers in any part of the province are not able to procure experienced labour, I may say to them through this Committee and through its published report, that experienced labour of this kind may be procured in the county of Kent, because every one there has tiled and the farmers all know how to tile, and the labouring men all know how to tile, so there would be no difficulty in getting experienced men if sufficient wages are given. Of course, if they give ordinary wages they will get ordinary workmen.

Mr. ROBINSON (Elgin).—What Mr. Stephens has said might also be said about the county of Elgin. We have there a large number of men experienced in tile drainage.

THE WITNESS.—I have found no difficulty in any drains I put in, and I have observed my neighbours' draining, and they have found no difficulty.

By Mr. Stephens :

Q. Any ordinary man can lay tile ?
A. Any ordinary man with a head on who tries to use it. The trouble is sometimes to get the man.

By Mr. Robinson (Elgin):

Q. Have you any one to trust ? Any man to put the drain in for you ?
A. I usually make the bottom. Of late years since I have been alone I make the bottoms myself.

DEPTH OF DRAINS AND MODE OF DIGGING.

In regard to the depth and mode of digging I would say something. Drains in our county are not as deeply sunk as Mr. Stephens has spoken of. They are usually put in slack places, and the water naturally flows into them. Our drains are usually dug now after this manner. We take a plough and plough a furrow which we can throw the earth up, one half out on each side, and we plough again and go down as deep as we can and up the other side. In the first two furrows we would take about 7 inches deep and the next two about 5 inches more. This can be shovelled out without digging. Then we take a long draining spade and go its full depth; that is where we have a long slope.

By Mr. Stephens :

Q. Don't you find that the drain wants to be kept perfectly straight to keep your tile neat when you come to the bottom ?
A. You have to dig your drain quite straight.

By Mr. Broder :

Q. Horizontally ?
A. And vertically.
Q. How far will you go down ?
A. Two to three feet.
Q. And frost does not affect you ?
A. No. We have more snow than you have in Kent.

By Mr. Kidd :

Q. I suppose the frost would not go as deep where there is tile draining ?
A. Anywhere we have tile we never had any bother with frost in our drains.

By Mr. Broder :

Q. Your experience is all favourable to tile drainage ?
A. Certainly.

APPENDIX No. 2

Q. How about your neighbours ?
A. Anybody who has done it has benefited.
Q. But it has not been adopted generally ?
A. A number of farms have no ditches yet.

By Mr. Wright :

Q. Have they any outlet ?
A. Lots of outlet. In regard to the general adoption of tile drainage, the cost, of course, has to come out of the pocket of a farmer, and some of them are slow to adopt it. But I think if they can be shown that tile drainage means money in their pocket they would soon take it up.

By Mr. Robinson (Elgin) :

Q. You would strongly advise your neighbours to under-drain ?
A. I would strongly advise them.
Q. You believe it pays ?
A. I certainly do.

DRAINAGE IN RELATION TO EARLY SOWING.

By Mr. Stephens :

Q. As long as the soil is porous enough to take the water to the drain ?
A. We have not found any trouble, and we have some hard clay. Usually there is a slack or pond, and we have drained these ponds out and drained these slack places, and got on the land to work it earlier in the spring.
Q. Much sooner than you could otherwise ?
A. Oh yes, much sooner than you could otherwise.

By Mr. Robinson (Elgin):

Q. You find it is the hills not drained you can get on last in the spring ?
A. Yes, you can get on to the hollows a day or two sooner than the hills, and the ground is easier worked where it is drained.

By Mr. Stephens :

Q. And the hills you would drain ?
A. We have not drained hills much.
Q. You would advise draining them ?
A. No; I do not think land is valuable enough at the present time to advise draining the hills. I would not go to excess.

By Mr. Broder :

Q. You drain the ravines ?
A. Yes, we drain the hollows between these hills.
Q. That is economical.
A. You see, the roll of the land allows the surface water to get off, and naturally leaves the hills dry enough.

DETAILED ESTIMATE OF COST OF DRAIN CONSTRUCTION.

Q. Would you give us your idea of the cost, as you do not put them together as close as in other counties ?
A. In regard to the cost I have here an estimate of the cost of digging a drain, as I have indicated. With a 2½-inch tile the cost would be 28 cents.

Q. Per rod ?

A. Per rod.

Q. And how much would it cost to lay per rod ; Mr. Stephens said 25 cents in his country.

A. I would reckon the cost of digging at 15 cents a rod. We used to get it dug for 10 cents, but labour has gone up. That is with boarding the men ; possibly it would be 18 cents or 20 cents when men board themselves.

Q. It would be about the same estimate as Mr. Stephens ?

A. Draining a ten acre field with a 4-inch main drain and 3-inch laterals would cost $5 an acre.

Q. That is very cheap ?

A. Draining, as I have stated, and putting 160 rods in ten acres, 40 rods of this would be 4-inch tile and the other 120 rods 3-inch. That would cost $5 an acre, that is boarding the men yourself.

By Mr. Wright :

Q. Have you any large drains under the Municipal Drainage Act ?

A. We have one or two.

Q. Not near you ?

A. No.

Q. You have just to find the best outlet you can ?

A. We have lots of outlets. We have streams and hollows, all we want in our country, for outlets.

By Mr. Broder :

Q. Are tiles of easy access there ; you have no trouble ; you get them near ?

A. Oh, yes.

Q. You manufacture them there ?

A. Yes.

A vote of thanks was tendered to the two witnesses.

Mr. HENRY STEPHENS.—Gentlemen, I feel very grateful for the attention you have given us, and if you have got any information from what we have said you are heartily welcome to it.

Having read over the preceding transcript of my evidence, I find it correct.

D. M. MACINTYRE,
Farmer, Paisley, Ontario.

AGRICULTURAL DEVELOPMENT

HOUSE OF COMMONS,
ROOM 34,
FRIDAY, May 15, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock a.m., Mr. Douglas, Chairman, presiding.

Professor WM. SAUNDERS, Director of the Dominion Experimental Farms, attended by request and addressed the Committee as follows :—

Mr. CHAIRMAN AND GENTLEMEN,—It affords me much pleasure to appear before you once more to submit for your criticism and for your information such particulars in regard to the work of the experimental farms and the general progress in agriculture as I may be able to present to you. The rapid advancement made by Canada during the past few years in the development of her agricultural resources is marvellous and the gain has been mainly along lines where growth is likely to be permanent and increasing.

During the past seven years the exports of farm produce from this country have more than doubled and now amount to over $80,000,000 a year. The articles in which the larger part of this increase has occurred are, wheat, flour, oats, peas, cattle, pork, bacon and hams, poultry, cheese, butter and fruits.

Along these lines the resources of Canada for the extension of trade are practically unlimited. We have suitable climates, an enormous area of fertile soil and all other facilities necessary to a vast increase of our agricultural productions and we are now beginning to obtain the increase in population needed to utilize the great wealth which has long lain buried in the fertile soils of this country.

The results of the farm operations of the past year have been most encouraging. Throughout the whole of Canada, from the Atlantic to the Pacific, nearly all the more important agricultural crops have been highly satisfactory and a bountiful harvest has been gathered.

It has been my privilege during the year to see large areas of these crops in nearly all the provinces and territories of the Dominion, and I can assure you they have been most encouraging and gratifying to the people.

When we compare the condition of agriculture in Canada at present with what it was in 1884, nineteen years ago, there is great reason for thankfulness. Then farming was in a most depressed condition and a Committee of your Honourable House was appointed to inquire into the causes of this depression, and careful investigation led to the conclusion that the lack of success was not due to any fault in the climate or soil of this country nor to a lack of industry among the farmers, but to defective farming, to want of skill and knowledge in all departments. There was a lack of information as to proper preparation of the soil, the maintenance of its fertility, to a suitable rotation of crops and as to selection of the best varieties of farm crops for sowing. There was great want of a fuller knowledge regarding stock breeding and the adaptability of breeds to particular conditions. Improvements were sadly needed in connection with the manufacture of cheese and butter, also in the cultivation of suitable varieties

of fruit. There was also a deplorable lack of knowledge as to the insects and diseases from which the farmer suffers large losses in crops. Also in regard to common weeds which sometimes overrun his fields and rob him of a large proportion of the fruit of his toil.

The House of Commons promptly adopted measures with a view to remedy this sad condition. The Dominion system of experimental farms was established and work shortly begun to demonstrate which were the best methods to adopt looking to the production of the highest quality and largest quantity of the more important farm crops in all the different climates of the Dominion.

The first time I was asked to appear before this Committee was in 1887, and I have had the privilege of coming before you every year since then. I have thus had the opportunity of presenting to you annually for sixteen years some particulars relating to the measures adopted from time to time to assist farmers, and have had the benefit of your criticisms and suggestions.

At first advancement was slow, demonstrations were wanted along every line, but each year a gain more or less satisfactory was made. The provincial governments soon vied with the Dominion in efforts to assist the farmer to a better knowledge of his business. The Canadian farmer has been earnest in his desire to improve his conditions and has shown an aptitude for acquiring and utilizing practical information in all lines of farm work, and to-day we find, as a whole, no farmers better informed than Canadian farmers, and as a body none more prosperous. Sixteen years have worked a mighty change, and the results of the efforts made for the farmers' advancement have laid the foundations for a prosperous condition of agriculture, of which as yet we see only the beginning.

But we must never forget that we shall always have much to learn, and a striving for improvement in quality of product, in methods to economize the cost of production and to increase the output should never cease, and we should ever be on the search for new outlets for our productions, and be always ready to meet the wants and wishes, as far as is practicable, of those who are willing to trade with us.

Permit me to call your attention to some features of interest in connection with those portions of the helpful work connected with farming to which it has been my privilege to devote much personal attention during the past sixteen years. The reason why I propose to restrict my remarks mainly to certain special lines is that my associates on the Experimental Farm staff, all of whom have, under my direction, done excellent work, may present, as they appear before you later, the results of the work they have done, in their own way, without being anticipated by any statement of mine.

In the proper preparation of land for crop, which varies so much in different parts of the Dominion, great advancement has been made. On the western plains the adoption by the best farmers of the summer-fallowing of about one-third of their land every year now is very general. The system of fallow most approved is to plough deep, 7 to 8 inches, before the last of June, and to cultivate the surface several times during the growing season to destroy weeds. By this treatment the moisture in the soil is economized and the land largely cleaned from weeds. The crops on summer-fallow, even if the total cropping area is thus made somewhat smaller, are so bountiful that greater profits are had with less labour.

By Mr. Wilson :

Q. You are speaking now of Manitoba and the North-west Territories ?

A. Yes, of the methods in practice there.

In the east the fall ploughing of land has become almost universal. By this practice spring work is materially advanced and early sowing made practicable. The advantages had from early sowing were referred to in my evidence before you two years ago, but so important a point will bear repeating. The average of ten years' experience in early, medium and late sowing at Ottawa has shown that with wheat a delay of one week after the ground is in good condition to receive the seed has entailed a loss of

over 30 per cent, two weeks 40 per cent, three weeks nearly 50 per cent, and four weeks 56 per cent of the crop.

With oats a delay of one week has caused an average loss of over 15 per cent, two weeks 22 per cent, three weeks 32 per cent, and four weeks 48 per cent. In the case of barley a delay of one week has resulted in an average loss of 23 per cent, two weeks 27 per cent, three weeks 40 per cent, and four weeks 45 per cent. With pease the loss in the crop from delay has been less. A delay of one week has lessened the crop to the extent of four per cent, two weeks 12 per cent, three weeks 22 per cent, and four weeks 30 per cent.

The wide publication given to the results had from these experiments has led farmers to practise early sowing, and in this way crops have been improved.

BARN-YARD MANURE,—FRESH AND ROTTED.

While the mechanical condition of the soil is an important factor in crop production, its fertility is a still more vital one, hence great attention has been given in the work of the experimental farms to showing the importance of maintaining the fertility of the land, and in demonstrating how this can be done most economically and most effectively. The use of barn-yard manure is almost as old as agriculture itself, and its great usefulness in assisting crop growth was early recognized, but the proper methods of storing and handling it so as to avoid as far as is practicable waste and loss have only recently been understood. Where plenty of barn-yard manure is available little else is actually necessary since it contains all the materials required for vigorous crop growth. It has been shown by the results of experiments conducted at the Central Farm that the ploughing under of manure fresh from the barn-yard is both economical and effective. That while in the process of rotting, barn-yard manure loses more than half its weight, its effectiveness in crop production is not materially increased, and that a ton of fresh barn-yard manure ploughed under is equal to a ton of rotted manure in crop producing power. A carefully planned series of experiments conducted for 14 or 15 years has given the following average results :—

	Rotted Manure.		Fresh Manure.	
	Per Acre.		Per Acre.	
	Bush.	Lbs.	Bush.	Lbs.
Wheat, average for 15 years	22	22	22	44
Oats, 14 years	51	13	55	22
Barley, 14 years	35	5	35	8

FERTILIZING WITH CLOVER PLOUGHED UNDER.

The ploughing under of clover has been found most effective as an additional source of fertility. It increases the store of available plant food by the addition of nitrogen obtained directly from the atmosphere. It adds also to the mineral plant food available, potash and phosphoric acid by gathering these from depths not reached by the shallower root systems of other farm crops. It also serves at a catch crop during the autumn months, retaining fertilizing material brought down by the rain, much of which would otherwise be lost. Further it supplies the soil with a large addition of humus whereby it is made more retentive of moisture, and results in a deepening and

mellowing of the soil. Humus also furnishes material in which those minute forms of germ life which act so beneficially on the soil can thrive and propagate freely.

During the past season a bulletin has been published at the Experimental Farm on the usefulness of clover as a fertilizer, prepared jointly by the Chemist of the farms, Mr. F. T. Shutt and myself. In this bulletin an account is given of the results had in increased crops from the use of clover in a large series of experiments conducted during the past four years with oats, Indian corn and potatoes. There are a number of copies of this bulletin on the table if any gentleman would like to have them. The facts submitted furnish very strong evidence of the usefulness of clover in this connection.

EXPERIMENTS IN 1902, WITH CLOVER AS A FERTILIZER.

A series of 18 plots was arranged for on one-half of which clover was sown with grain in the spring of 1901. When the clover had made good growth late in the autumn of that year it was ploughed under. In the alternate plots the same grain was sown, and at the same time, but without clover. In the spring of 1902 six of these plots were sown with Banner oats. On the three plots where clover had been sown and ploughed under, the oats yielded an average of 71 bushels 13 pounds per acre, while those sown on the adjoining plots where no clover had been used gave an average return of 61 bushels 6 pounds, a difference of 10 bushels 7 pounds per acre in favour of the plots on which clover had been grown.

On another six plots Indian corn was grown, three with clover and three without clover. In this case the variety known as Selected Leaming was used. The three plots on which the clover had been sown and turned under gave an average return of 22 tons 533 pounds per acre, while those on which no clover had been used gave only 16 tons 507 pounds per acre, a difference of 6 tons 26 pounds in favour of the plots on which clover had been used. Following the same plan, six plots were planted with potatoes ; the three which had the benefit of the clover gave an average of 391 bushels 40 pounds per acre, while those on which no clover had been sown gave an average crop of 352 bushels 40 pounds, a difference of 39 bushels per acre in favour of the plots treated with clover.

A second series of plots was planned in 1902 to ascertain to what extent the good influence of the clover would be maintained in increased crop, the second year after ploughing under. In this instance, there were three trials made with six plots each, three of which were treated with clover and three without clover. The clover was sown with grain in the spring of 1900 and ploughed under in the autumn of that year. In the second year the oats on the clover ground gave an average of 20 bushels 5 pounds per acre more than on the plots where no clover had been used. The corn gave an average increase of 2 tons 187 pounds, and the potatoes an average of 13 bushels 20 pounds on the plots treated with clover. In the case of the oats there was a large increase also each year in the weight of the straw in favour of the clover plots. In this instance a part of the large increase in grain would probably be fairly attributable to the favourable season.

By Mr. Erb :

Q. Would not that apply just as much to the plots on which there was no clover turned under ?

A. No doubt, the favourable weather would be a benefit to both, but the plots having the additional fertility and more favourable conditions which the clover gives would have a decided advantage.

The increase in grain where clover had been turned under was 20 bushels 5 pounds per acre more than on those plots where the clover was not used, and this was in the second year after the turning under of the clover. Nothing had been done to the soil meanwhile ; the object was to find out whether the influence of the clover was lasting.

APPENDIX No. 2

By Mr. Cochrane :

Q. We understood that the difference was partly caused by the rain. Would not the rain have the same effect on the plots which have the clover as on those which have not ?

A. On the plots where clover had been sown two years previous, the conditions were more favourable for the growth of an oat crop than where no clover had been used, and the increase following the ploughing under of the clover the first year was a little over 10 bushels per acre. It was over 20 bushels the second year, the clover thus manifesting its influence in a more striking manner in the second year.

By Mr. Erb :

Q. This would seem to show that the clover was of more benefit the second year than the first ?

A. So it would appear in this instance, but you must remember that the year was a more favourable one for oats than the preceding season.

Q. But if the climatic conditions were more favourable the second year, it would apply as much to the plots without clover as to those that were sown with it ?

A. That might be, if the land was in the same condition, but the clover ploughed under had made the land more favourable for crop growth, which gave those plots an additional advantage over the plots where clover had not been grown.

The Indian corn gave an average increase of 2 tons 187 pounds, and the potatoes an average increase of 13 bushels 20 pounds on the plots treated with clover. These crops showed a much smaller increase than they did the first year, as the season was less favourable for them.

By Mr. Cochrane :

Q. Was that sown on land where clover had been sown on the same spring ?

A. It was sown on land where clover had been sown two years previous.

Q. Oh, yes, excuse me but what I want to find out, and I think it is important ; when you started this experiment was it from the crop of clover sown in the spring of the same year ?

A. The clover was sown in the spring with the grain.

Q. And then the crop of clover was ploughed under the next fall ?

A. Yes, and the next year nothing further was added to the soil, so that the effect of the one sowing of clover on the second crop of grain might be ascertained.

By Mr. Erb :

Q. That is, the clover was ploughed under in the fall of the same year that it was sown ?

A. In this instance the clover was sown in the spring of 1900 and ploughed under in the fall of 1900. I have given the results of the crop of 1901. Then in the spring of 1902 the same land was used for the crops referred to and the results I have given show the influence of the clover the second year after turning under.

During the five years in which these trials have been conducted the average increase in the oat crop where clover has been used has been about 9 bushels per acre. In corn there has been an average increase of over 4 tons per acre and in potatoes the difference in favour of the clover plots has been 34 bushels per acre.

RESULTS OBTAINED FROM SPECIAL EXPERIMENTS WITH FERTILIZERS.

The benefits of clover when ploughed under in increased crop have also been clearly demonstrated in another important series of experiments. I refer to the special experiments which have been carried on for the past 15 years to gain information as to the action of fertilizers and combinations of fertilizers on the more important farm

crops. The experience gained has been reported on annually for the last ten years and will probably be more or less familiar to most of the members of the Committee. There were set aside for this work 105 plots of one-tenth of an acre in five sets of 21 each. Nineteen plots in each series were treated with different fertilizers and combinations of fertilizers and the other two plots were left as check plots and no fertilizer of any sort applied to them. The same crop has been grown on this land every year, but after ten years had elapsed the fertilizers were discontinued and clover was sown with the grain and ploughed under every year. No. 3 plot in each series was one of the check plots on which 10 crops of oats had been grown in succession without application of any fertilizer whatever. The oat crop for the ten years ending with 1898 had averaged 30 bushels 23 pounds per acre, but that year the yield was only 28 bushels 8 pounds, or about 2½ bushels below the average. With the use of clover the crops in the four subsequent years have stood as follows: In 1899, the effect of the clover was scarcely seen, the crop being 29 bushels 24 pounds. In 1900, it was 47 bushels 2 pounds. In 1901 it was 48 bushels 3 pounds, and in 1902 it was 46 bushels 11 pounds. All this time these crops were grown without giving any fertilizer or other improvement to the soil than the ploughing under of clover. During these last three years the crops averaged over 16 bushels per acre more than they had for the previous ten years, an astonishing increase, in view of the fact that oats have been grown every year on the same land for the whole period. As another illustration, I would cite plot No. 11. On this plot there were used per acre, each year for ten years, 350 pounds of mineral superphosphate, 200 pounds of nitrate of soda and 1,500 pounds of unleached wood ashes. This liberal treatment must have furnished the soil with plant food in abundance. Yet the average crop of oats under this treatment for ten years was only 36 bushels 5 pounds per acre, scarcely an average of 6 bushels more than from the unfertilized plot. After this the fertilizers were discontinued and clover grown and ploughed under each year. In 1899 the crop, which had averaged 36 bushels 5 pounds per acre for ten years, was 37 bushels 2 pounds. In 1900 45 bushels 20 pounds, in 1901 49 bushels 29 pounds, and in 1902 the yield was 51 bushels 6 pounds per acre, an average increase for the past three years of 9 bushels 30 pounds per acre.

By Mr. Erb :

Q. Was the same variety of oats sown every year ?

A. The same variety has usually been sown for a number of years. The varieties have been changed twice in fifteen years. A variety known as English White was used the first year, for the next four years the Prize Cluster was sown, and for the past nine years the Banner has been used. The particulars of these changes have been given in the reports each year.

Q. Whenever a different variety was sown, I suppose, a variety was selected which had proved itself to be more prolific ?

A. Yes, in selecting a new variety, one of the best sorts was chosen. The Banner oats have been grown for the past nine years.

By the Chairman :

Q. The continuance of one variety makes your experiment all the more valuable ?

A. We have realized that, and a variety chosen has usually been continued until it has been shown to be weak in the straw or less productive than others. Whenever a change has been made, it has been noted in the report.

By Mr. Robinson (Elgin) :

Q. What is the name of your best oat now ?

A. I think the Banner on the whole is the best variety we are growing now.

In other crops also the increase in yield following the use of clover has been very striking. In wheat, plot No. 3 had given, up to 1899, an average yield of 10 bushels 18 pounds per acre. That is a plot which never had any fertilizer whatever. With

the ploughing under of clover the yield, in 1900, was 13 bushels 45 pounds, in 1901, 17 bushels 20 pounds, and in 1902, 16 bushels 50 pounds, an average increase during these three years of 5 bushels 41 pounds per acre, being more than 50 per cent of an increase from the use of clover. In plot No. 11 of the wheat series, treated the same as plot No. 11, in the oats series, the average yield for the ten years ending with 1899, was 13 bushels 56 pounds per acre. In 1900, it was 18 bushels 20 pounds ; in 1901, 16 bushels 5 pounds, and in 1902, 14 bushels and 25 pounds, an average increase of 2 bushels 20 pounds per acre.

The results were still more marked with Indian corn. This crop on plot 3, after 10 years' test, was reduced to about 2 tons per acre. With one crop of clover, turned under, the yield of Indian corn was increased to over 8 tons per acre. On plot 11 the average of 10 years was 13 tons 1,090 pounds per acre. The ploughing under of a single crop of clover raised this the following season to 26 tons 505 pounds per acre.

On field roots, the beneficial action of clover ploughed under was also very striking. The turnips grown on plot 3 with no fertilizer for the 10 years ending with 1899, averaged 6 tons 1,863 pounds per acre, with one crop of clover ploughed under the average for the two years following was 10 tons 1,560 pounds, an average increase of 3 tons 1,697 pounds per acre; more than 50 per cent.

The mangels on plot 3 had given an average to 1899, of 8 tons 1,587 pounds. The two years following the turning under of clover the crop averaged 10 tons 1,560 pounds, an increase of 2 tons per acre, or nearly 25 per cent. On nearly all these plots with all the different fertilizers used, the discontinuance of the fertilizers and the sowing of clover and ploughing under has produced a decided increase in the crop.

Such evidence I think clearly establishes the claim made for clover, that it is a most valuable addition to the soil which invariably results in an improved condition of the land and brings increased crops.

SOWING CLOVER IN THE NORTH-WEST.

By Mr. Chairman :

Q. In reference to the sowing of clover in the spring in the North-west for example would it pay to sow the clover and turn it under the first season for its beneficial effects ?

A. In our experience in the North-west the sowing of clover with grain as we do here is unsuccessful The grain takes all the moisture out of the soil and the clover does not get a chance to thrive. To get any benefit from clover there, you must devote the season to it, and we have been trying to grow clover in place of summer fallowing, sowing clover in the spring and ploughing under in the autumn. It has been tried for three years but the soil is so rich on the prairies and contains so much surplus nitrogen that no benefit from the use of clover has yet been perceived. We hope by continuing this for ten or twelve years to demonstrate that it will result in increased crops most important in Canada. During 1902, 2,500,758 acres were devoted to oats in and experimental plots have been established at each of the western farms for this purpose.

By Mr. Wilson :

Q. It must be great waste for the farmers to bother with it ?

A. Yes, it would seem so, but the experience we are gaining for the future may be exceedingly valuable.

Q. But for farmers generally it would be of no value ?

A. There is no need of it at present, because all the plant food needed by the crops is already in the soil and is stored up there in great abundance.

COMPARATIVE RETURNS FROM VARIOUS KINDS OF OATS.

With your permission I will next speak of the Oat crop. This crop is one of the

Ontario and the yield was 106,431,439 bushels, an average of 42 bushels 6 pounds per acre which was 7 bushels 3 pounds above the average of the past twenty years.

In Manitoba the acreage devoted to oats was 725,060 and the total yield 34,478,160 bushels, an average of 47½ bushels per acre. In all the other provinces and territories it is also an important crop.

At the experimental farms larger crops have been grown than the averages mentioned. On the experimental plots the average yield in 1903 of all the varieties tested at Ottawa has been 65 bushels 19 pounds per acre. The best twelve varieties have given an average of 80 bushels 33 pounds.

The field crops covering 56 acres in all have ranged from 55 to 61 bushels per acre.

At the Nappan experimental farm in Nova Scotia the Superintendent gives the average yield of all the varieties tested, as 90 bushels 18 pounds per acre. The field crops on new land at 46 to 55 bushels 17 pounds per acre.

At the experimental farm at Brandon, Manitoba, the average yield on experimental plots of all the different sorts tried was 60 bushels 11 pounds; the best 12 varieties averaged 76 bushels 22 pounds.

At the experimental farm at Indian Head, N.W.T., the average of all the varieties grown was 67 bushels 30 pounds, while 12 of the best sorts gave an average of 82 bushels 28 pounds per acre..

The field crops covering 53 acres in all, averaged 76 bushels 32 pounds per acre, which was about 9 bushels more than the average of the plots, showing that sometimes the field crops will go above the average of the experimental plots, but most commonly we find the experimental plots give the larger yields because as they have paths between them they have a larger margin in proportion to the area covered and may be expected to give a little more.

Four acres of Goldfinder averaged 89 bushels 17 pounds per acre. Nine and a quarter acres of Banner averaged 87 bushels. Five acres of Wide-awake 87 bushels, and 6 acres of Tartar King, one of the new English sorts we have beeen introducing of late, gave at Indian Head an average of 85 bushels per acre.

At the British Columbia experimental farm at Agassiz, the average of all the varieties tested was 63 bushels 10 pounds. The best 12 sorts gave an average of 73 bushels and 4 pounds per acre. The average given by the whole of the varieties tested on all the experimental plots at all the farms in 1902, was 70 bushels 4 pounds per acre, showing that the average of the crops of oats at the experimental farms is very much larger than the average obtained by the farmers in any of the provinces.

About 60 varieties of oats brought from many different countries have been under trial each year for the past seven or eight years in uniform trial plots at all the experimental farms. During the past winter the records of all of these have been gone carefully over and all those which have fallen below a certain high standard of average productiveness, have been dropped from the list, thus reducing the number under cultivation. This will bring more prominently before the farmers of Canada those sorts which we have found to be most highly productive.

By the Chairman :

Q. Do you retain the Improved Ligowo ?
A. Yes.
Q. It does remarkably well with us ?
A. It has also given good satisfaction in many other parts of the country.

THE BANNER OAT IN CANADA AND IN SCOTLAND.

As the result of eight years' trial on experimental plots the Banner oat still stands at the head of all the varieties tested with the wonderful average crop for the whole period of 76 bushels 29 pounds, taking all the experimental farms into account.

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It has also done remarkably well in field crops,and during the past eight years has averaged in all the field crops grown at all the experimental farms 69 bushels 13 pounds per acre, showing that in field culture it has come very close to the yield obtained on the experimental plots. In Great Britain the Banner oat received from Canada continues to attract much attention. In my evidence before this committee in 1900, I mentioned that samples of Banner and other promising oats had been sent in 1899 to Prof. Patrick Wright, principal of the Agricultural College in Glasgow, Scotland. These were forwarded in response to a request from him for samples of the best sorts of oats cultivated in Canada to test alongside of the best varieties grown in Scotland. Prof. Wright's reports show that from the outset the Banner oat took a leading position among the many varieties he was growing, and the next year a request came from him for twelve bushels for further trial, and in the year following for fifty bushels more. These were distributed among a number of leading farmers in different parts of Scotland, and the reports published were so favourable that a great demand was created for the seed and several large orders were received by seed firms in Canada last year for these oats for use in Great Britain. In a recent letter from Prof. Wright, he says : 'It may interest you to know that the Banner oat has now taken an assured position among the oats cultivated in Britain, and has proved itself to be equal to if not better, than any other oat we have.' In a recent letter from James Bruce, who visited Canada in 1880 as one of the earlier farm delegates, he says : 'I may mention that Banner oats are being introduced from Canada into this country and the results are very satisfactory. This season I have sown fifteen acres of them.'

By Mr. Le Blanc :

Q. What is the quantity of seed used to the acre ?

A. Two bushels is the quantity we use on our experimental farms, and that, I think, is about the quantity of seed generally used.

Another of the varieties sent to Scotland from here is also attracting notice. This is the 'Wide-awake.' Of this variety in a recent letter Prof. Wright speaks as follows : 'In our last season's trials a remarkably good result is shown in our tables by the 'Wide-awake' oat of which we also got the original seed from you. It has done so well that I am writing you now to ask if you would be good enough to get sent to me without delay twenty quarters (160 bushels) to be used as seed this season.' I could not get that quantity, but succeeded in getting fifty bushels, which were sent in good time for sowing. In a letter of March 17, he says : 'If this oat does as well with us next year as last, it is also likely with the Banner to pass into general cultivation here. It is gratifying to know that we are thus helping farmers in the mother country with Canadian varieties of a very productive and valuable character.

CONSIDERATIONS IN ESTIMATING THE VALUE OF AN OAT.

In estimating the value of an oat the relative weight of kernel and hull must be considered. This will vary with the variety and with the weight per bushel of the sample. The lighter the weight per bushel the larger is the proportion of hull. In a very light sample weighing less than 20 pounds to the bushel the proportion of hull has been found to be over 50 per cent, whereas the same variety of the standard weight would only have about 36 per cent of hull. I have some samples here of oats with the hulls on and some that are free from the hull from which you will see how the different varieties vary, in different seasons in plumpness, and hence in the proportion of kernel which they produce. Here is a specimen of the Tartar King, which has a very plump kernel.

By Mr. Chairman :

Q. The proportion would differ very much owing to the lateness in sowing ?

A. Yes, when sown very late the kernel is apt to be light.

The Banner is generally regarded as a thick hulled oat, but in our experience it can only be considered as medium in this respect. The sample before you from Indian Head weighs 44½ pounds per bushel and has 29·72 per cent of hull. This has been put through a barley scutcher which has rubbed off the awns and a little of the hull at the tip which increased the weight per measured bushel over 2 pounds, as the oats when so treated lie closer together. This is the way we prepared them for the seed distribution this spring. The proportion of hull is also reduced by this process about 2 per cent. The same oat grown at Ottawa and similarly treated, and weighing after passing through the scutching machine 42¼ pounds per bushel had 28·63 per cent of hull. An untrimmed sample of Banner weighing 34½ pounds per bushel had 31½ per cent of hull. Of the oats we have been distributing this season the Improved Ligowo has the smallest proportion of hull.

The CHAIRMAN.—I would like to state to the Committee that a few years ago my son and I got samples from the Farm here, and last year we had 70 acres, and the best crop of oats we have ever had on our farm.

By Mr. Robinson (Elgin):

Q. What kind ?

The CHAIRMAN.—Improved Ligowo.

PROF. SAUNDERS.—This was grown at Indian Head and weighed 46½ pounds per bushel.

By Mr. Wilson :

Q. Is this after the hulls are taken off or before ?

A. No, not after the hulls have been taken off but after it has been passed through a barley scutcher which rubs off the awns, and a little of the hull at the tip.

Q. These that are hulled, are marked 44¼ pounds ?

A. That is meant to indicate the weight of the oat before it was hulled.

This sample of Improved Ligowo from Indian Head which has been through the scutcher has 25·9 of hull or practically 26 per cent. The same variety grown at Ottawa has 26·6 per cent of hull. The original sample imported from France had 28 per cent of hull, showing that it has not increased in thickness of hull since its introduction in this country.

The Tartar King oat grown at Ottawa seems to be somewhat thicker in the hull and has 34·35 per cent in a sample weighing 37½ pounds to the bushel while another sample grown at Indian Head weighing 46¾ pounds per bushel has 27·9 per cent practically 28 per cent of hull. Another sample of the same oat from Indian Head weighing 35 pounds per bushel had 32 per cent of hull. The original sample as received from the Garton Bros., of England, weighed 39½ pounds per bushel and had 30·94 per cent of hull. From these figures it is evident that the Tartar King is thicker in the hull than most other oats we have been growing.

The 'Wide-awake' oat, which I have referred to as spoken so favourably of in Scotland, as grown at Indian Head, weighed 46½ pounds per bushel and had 27·4 per cent of hull. The Waverley, another of the new oats introduced by the Garton Bros., of England, grown at Indian Head, weighed also 46½ pounds per bushel and had 26·7 per cent of hull. Those grown at Ottawa, weighing 41 pounds per bushel, gave 26·3 per cent of hull. The Goldfinder, a yellow oat brought from the Garton Bros., of England, as imported, weighed 35 pounds per bushel and had 24·9 per cent of hull ; grown here in Ottawa in 1902, it had 28·6 per cent of hull, with a weight of 39 pounds per bushel, and at Indian Head, 28·1 per cent of hull, with oats weighing 42 pounds per bushel.

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In some instances there seems a tendency to produce a thicker hull in this country; in others a thinner one. Investigations have not yet gone far enough along this line to permit of any decided opinion as to the influence of climate on this subject. One point which our examinations seem to prove is this : that the actual weight of hull in a given number of kernels of any one variety of oats is practically the same, whether the oat weighs 30 to 40 pounds per bushel, and the difference in weight is made up in the size of the kernel. This, after all, is not a matter of much surprise, when we look carefully into the subject. When an oat during its growth heads out, the husk is of full size, and the framework for holding the kernel is all there. The covering for the future oat is fully developed, the flower is produced in the cavity prepared for it, fertilization takes place, followed by the growth to maturity of the kernel. The plumper the kernel, the heavier is the oat.

ANALYSIS OF HULLS AND KERNELS.

What gives to this subject the greatest importance is the fact that the hull contains a very small proportion of nutritive matter. The quantity of albuminoids or flesh-forming constituents and of fat in oat hulls is not much more than half of what is found in oat straw. Oat hulls, according to Henry, contain 3·3 per cent of total albuminoids. Mr. Shutt, the Chemist of the Experimental Farms, finds this to be only 2·6 per cent in Canadian oats, while in oat straw the average of six analyses gives 4·1, and for the kernel of the oat, 14·51, showing the immense difference in feeding value between the husk or hull and the kernel, and pointing to the importance of the farmer growing the plumpest and most productive sorts. The proportion of fat in the hull is relatively less. While the kernels contain 6·24 per cent of fat and the oat straw 2·1 per cent, the proportion of fat, as given by Henry, is 1 per cent in the hull, and by Shutt, ·78 per cent (a trifle over ¾ of 1 per cent). I append the results of Mr. Shutt's analysis, which is of the Banner oat grown in Ottawa in 1902.

CROP OF 1902, C.E.F.

Proportion of kernels to hulls :

Kernels	71·92
Hulls	28·08
	100·00

——	Moisture.	Albuminoids.	Fat.	Carbohydrates.	Fibre.	Ash.
Oats, (whole grain)	12·74	11·22	4·82	58·84	9·47	2·91
Kernels	12·03	14·51	6·24	63 15	1·93	2·14
Hulls	10·19	2·60	0 78	49·63	31·63	5·17

FRANK T. SHUTT,
Chemist, Dom. Expl. Farms.

Central Experimental Farm,
OTTAWA, May 14, 1903.

From these statements and figures it will be seen that heavy oats are worth a higher price than light oats, as in buying them the purchaser gets a larger amount of the highly nutritious kernels. The kernel contains nearly six times as much albuminoids as the hulls and eight times as much fat.

Among the new kinds of oats which have been obtained for test this year at the Central Experimental Farm there are two rather extraordinary sorts, obtained from Great Britain, where they have been grown by the Garton Bros. One is a black oat called the Excelsior, and the other, a white oat, known as Storm King. Both are unusual for the size of the oat and the weight of the kernel. The proportion, however, of hull to kernel in these new oats is larger than in most of the samples I have referred to. Excelsior weighs 44 pounds per bushel and has 32·3 per cent of hull. Storm King weighs 40½ pounds per bushel and has 33·9 per cent of hull. Hence, notwithstanding the large size of the kernels of these new varieties, if they do not give a heavier crop than the Banner they will prove less profitable for feeding purposes than that variety, because they contain a larger proportion of hull, which is of little value for feeding purposes.

By Mr. Stephens :

Q. Have you experimented to find whether early sowing has anything to do with the weight of the hull ?

A. We have found practically no difference in that, although a good many samples have been examined. It is scarcely to be expected that it should. When the head of the oat comes out of the sheath the hull is there of full size just as in the ripened grain, and though when ripe it dries up to a certain extent in curing the average weight and thickness of the hull is there. Where the oat has a very stiff straw, as in the Tartar King, the hull is a little thicker. Some weaker strawed varieties have thinner hulls. We have grown one known as Doncaster, which has the thinnest hull of any sort we have tried. I think it will be found that no matter what the variety of oat, if you take 100 grains of any kind the hull will weigh practically the same whether the oat is 20 pounds to the bushel or 45 pounds to the bushel. But where the oat is very light the proportion of hull will be correspondingly larger. Hence the importance of getting plump oats, with more kernel, which, as I have said, contains six times as much of albuminoids and eight times as much fat as the hulls.

By Mr. Wright :

Q. Can they use these black oats at the cereal factories for foods ?

A. No, the managers of the mills will not buy oats from the districts where black oats are known to be grown for fear of getting some of them mixed with the white varieties, which would produce black specks in the oatmeal. Black oats usually bring about two cents per bushel less than the white sorts. Some people, however, prefer them for feeding purposes.

Q. In our section farmers do not feed ordinary black oats because the hulls cause a soreness in the throats of the animals.

A. They find the hulls strong and coarse ?

Q. Yes.

A. We have not found any objection from that source, but it is very likely there is something in it, because some of these varieties are rather thick in the hull.

By Mr. Stephens :

Q. I think in some districts they have machinery to take them off ?

A. Yes, in the oatmeal mills they do it. Putting the oats through a barley scutcher takes off the tips with the sharp awns completely, and at the same time increases the weight per bushel about 2 pounds.

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By Mr. Kaulbach :

Q. Why is the Banner oat in the North-west, at Indian Head, so much heavier than at Ottawa ? Is it due to the climate ?

A. What did you understand to be the difference ?

Q. It was 46¾ pounds at Indian Head, and for that at Ottawa you gave the weight as very much less.

A. That figure was given for the Tartar King. The Banner grown at Indian Head weighed 44½ pounds, that grown at Ottawa 42½ pounds in field culture, but in some of the experimental plots there was some rust, which reduced the weight of the kernel in some instances to about 34 pounds, whereas in the field plots, where we had no rust, it reached the higher weight. A favourable season with no rust will always result in a heavy sample. I would again emphasize the fact that in buying oats it pays the farmer to give a higher price for a heavy oat. When he gets an oat that will weigh 40 pounds to the bushel, he gets a larger amount of this very rich and highly nutritious food of which the kernel is composed.

By Mr. Ross (Victoria) :

Q. Can you explain to us why the average yield at the Nappan Farm is so much higher than here ?

A. At the Nappan Farm and all through that part of Nova Scotia the oats this year were unusually heavy in crop. When I first received these returns, I thought there might possibly be some error in the figuring, but careful inquiry satisfied me that they were correct. The Superintendent also cited instances of neighbouring farms where the crops had been just about as good.

By Mr. Wilson :

Q. Was there much difference ?

A. There was a difference of nearly 25 bushels per acre between the results had at Ottawa and Nappan. The figures are given in Bulletin 41.

By Mr. Robinson (Elgin) :

Q. Have you included any hulless oats in your trial plots ?

A. We have tried a Chinese hulless oat, but we find it difficult to get them in commerce with a high degree of vitality. Sometimes only a small proportion of them will grow, and in productiveness they are not equal to such oats as the Banner.

By Mr. Kaulbach :

Q. In the reply given to my question in reference to oats, in regard to the greater quantity at Indian Head as compared with that at Ottawa, can you say whether it was from the rust that was prevelant here at Ottawa that the difference was so great ?

A. In think that was the reason, as the field crops, where there was no rust, the oats were heavy.

Q. You do not attribute it to the character of the soil or the temperature ?

A. Some part of it may be due to the soil, as that is very much richer at Indian Head than at Ottawa, and as a rule, and I think largely on this account, the land there gives a larger number of bushels per acre. I think the climate here is just about as favourable as it is at Indian Head, if we had an equally rich and fertile soil.

Q. I am sorry I was not here when the reference was made to the cultivation of clover. I followed up the information I received from the Experimental Farms here, and I adopted the idea of using some clover on a completely barren soil, a soil exhausted of its growing properties from being over-cropped. It was growing nothing when I purchased it but weeds and carraway and thistles. My experience was, that in following out the idea that I got from the farm here that sub-soiling turned out all the exhausted matter and buried the weeds, which disappeared completely in the following

year, and turned up a large proportion of red clay, upon which I sowed the clover and then turned it down after it had grown about six inches, and sowed timothy, clover and oats together. I cut that crop in autumn, and it was a good crop, and fed it and top-dressed from that crop, and I found an excellent crop the next year ; and I have been in that way bringing the farm into a state of good cultivation without putting anything on but what comes from the soil itself and the clover crop. I found this to give excellent results.

A. I am sorry Mr. Kaulbach was not here to hear the evidence given in reference to the series of plots we have had under experiment with fertilizers for fifteen years. For ten successive years these plots were sown with oats, or wheat, or barley, with two check plots, among them where these same cereals were grown without any fertilizer. After that these fertilized and unfertilized plots were annually cropped with the same grain, using no fertilizer but clover, and this has increased the average crop in two or three years fully 50 per cent.

By Mr. Cochrane :

Q. Have you any trouble on your farm in getting a good catch of clover ?

A. We have not had any trouble.

Q. Do you sow on fall ploughing ?

A. We sow with the grain in the spring on fall ploughing. We prefer very much to have fall ploughing.

By Mr. Cargill :

Q. Do you find as good results from enriching the soil by using clover as from enriching it by using barnyard manure ?

A. I do not know that I can answer that question directly, as we have not used them side by side. Our object has been to try in these experiments to eliminate everything that could create error in the results, and we have not used barnyard manure in connection with the clover. But in the experiments on these plots carried on for ten years different fertilizers were used. One plot received twelve tons of rotted manure annually per acre, and the adjoining plot twelve tons of fresh manure. After good crops had been grown on these plots for ten years, all fertilizers were discontinued and the ploughing under of clover substituted. Under this treatment all the plots have given increased crops. Those, however, which had barnyard manure have not increased so much as those which had artificial fertilizers or no fertilizers.

By Mr. Cochrane :

Q. Can you give me an idea—we have no idea on the farm—just how much a ton of manure is ? How much would there be in a load ?

A. We usually carry on our big wagon boxes, on the experimental farm, about one and a half to two tons. Its weight depends on the condition it is in. If it is fairly compact and moist, you can get a good deal more weight on the wagon. A good, ordinary two-horse load would not be much more than a ton, or a ton and a quarter.

By Mr. Cargill :

Q. How many tons would be a good coating for an acre ?

A. We prefer to use about twelve tons and to use it every three or four years rather than to use eighteen to twenty tons every fifth year.

Q. Well, in using twelve tons to the acre every year and seeding down with clover each year, what would be the relative cost to a farmer, the difference in cost between the clover, using it as a fertilizer, and putting the twelve tons of manure on the acre ?

A. Clover seed has lately been higher than usual. The twelve pounds needed for an acre can usually be bought for about one dollar and twenty cents. This year it has cost about a dollar and eighty cents.

APPENDIX No. 2

Q. Then that would be equivalent to the hauling of twelve tons of manure to the land.

A. I would not like to say that. The clover would give as much nitrogen to the soil as twelve tons of barn-yard manure, but not the same quantity of potash or phosphoric acid. I do not think clover can be made to take the place of barn-yard manure, but by its use barn-yard manure may be made much more effective.

Q. What I wanted to get was this ; that whether it be cheaper for the farmer to fertilize his land by sowing clover than to fertilize it by putting on twelve tons of manure counting the cost of labour and all the outlay.

A. I think there is no doubt that the results we have had in increased crops on many of these plots has been as great from one crop of clover as we have got at other times with ten tons of manure. At the same time I think that manure is of the greatest value to the land, and I would not like to say anything that would lessen its importance in the eyes of the farmer. What we advise farmers to do is to put on as much as they can of good barn-yard manure on their land. To put on if practicable twelve tons every three years and use clover in the interval. If they do that they will build up their land so that it will produce every year better crops than in the past.

Q. That is what we want to do ?

A. Yes, we are all aiming to produce as large crops as we can. And the fact that during the past year there was over seven bushels of oats produced in Ontario to the acre more than the average for the past twenty years is, I think, evidence of the value of the work which has been done for farmers and that better methods are beginning to prevail all over the country.

By Mr. Cochrane :

Q. You must remember that it was a moist year ?

A. I know it was a good season, and that counts much, but I think that improved methods of farming are entitled to some portion of the credit.

Q. I would like to ask the Professor if he restricts the number of these bulletins which he prints ?

A. My instructions in regard to the printing of bulletins are to get a sufficient quantity printed to supply the mailing list of the experimental farm and to leave a small surplus—our Canadian mailing list requires about 50,000 and the foreign mailing list three or four thousand, and we print 60,000 so that we can send to any member who desires them a few copies from 25 to 50 until the small stock left over is exhausted.

Q. I think it is a great pity that there was any restriction, because I think the information is a great deal more effective in this form than in the regular report, because they are too voluminous, but when the people get them in bulletin size they can grasp the information contained much more readily.

A. We send them to every one who asks for them.

Q. Yes, but do you not see that there are a great many people who do not know any thing about them until they get them ? Of course, if I had a certain number under my control, I could send them to the farmers in my riding who do not know anything about it now.

A. We have many farmers in all the ridings on our mailing list, and if the farm publications were distributed through the members as well, there would often be a duplication.

By Mr. Wilson :

Q. Every member sends in a mailing list, does he not ?

A. Yes, he can send in as many as he chooses, in reason, and they are entered on the permanent mailing list.

By Mr. Richardson :

Q. You stated a little while ago that you had not very good results through sowing clover as a fertilizer in Manitoba. Let me ask, on what kind of soils do you find the highest and the best results ?

A. In Manitoba and the North-west it is not so much a question of soil as it is a question of season. In a season that is reasonably favourable we do not find any difficulty in getting a good catch of clover at Brandon or Indian Head. What I said was, we have not had the same success there with clover sown with grain as we get in the east. In this part of the Dominion clover is sown with grain in the spring and ploughed under in the autumn. In this way the land is benefited without interfering with the regularity of the crops.

Q. What I mean is, what kind of soil, say down here, do you find most profitable and giving the best results from the use of clover as a fertilizer ?

A. On fairly good loamy and moderately heavy soil clover will make a stronger growth than it will on light sandy land, although it will do fairly well on light soil if it is in a reasonably good condition.

By Mr. Cochrane :

Q. Have you ever tried what clover will do when sowing it without grain at the Experimental Farm here ?

A. Yes, we have sown clover frequently in plots by itself, so as to test the value of the different varieties and the effect on their growth of the application of certain fertilizers.

Q. Then, it gives a good crop ?

A. It generally gives a better crop than when sown with grain, and generally grows heavy enough to require cutting once before the autumn. When it is desired to give the land the full benefit of the clover, if it cannot be pastured by animals, the cut clover is usually allowed to lie and decay on the ground.

PLOUGHING CLOVER UNDER.

Q. Last year, in our section of the country, the second crop was so large that on some farms we could not get it cut. In fact, they did not want it. What would the effect be of that crop, if ploughed this spring—the old crop and the roots ?

A. I think the results would be excellent and that the following crop would be much increased. In this way you would get the full benefit of the clover. We have found that even when the clover is killed out during the winter, that the dead parts have been very beneficial to the soil, although it has not done quite so much in increasing future crops as when the clover has been ploughed under green.

By Mr. Kaulbach :

Q. The better time for ploughing under would be in the autumn, would it not ?

A. That is the best practice, where you are sowing spring grain and do not want to miss a crop. Of course, if you are going to devote your land to potatoes or corn, we prefer to leave the ploughing under of the clover until about the middle of May following.

Q. Are clays more conducive to the growth of clover than any other soil ?

A. I think perhaps clover does grow more vigorously in a clay loam, but it grows well also in good sandy soil. That has been our experience here in Ottawa.

PREVENTIVES TO RUST IN OATS.

By Mr. Stewart :

Q. With regard to oats, do you find that by early sowing you avoid the rust ?

A. Yes, to a considerable extent the later oats are sown the more they are liable to rust, but rust has not often affected them with us so as to lighten the crop materially.

By Mr. Cochrane :

Q. Did you ever try salt to prevent it ?

A. We have tried salt for a series of years on oats, wheat and barley, and we have not found these plots to be exempt from rust, although we have used 300 pounds of salt per acre each year.

Q. Did you ever try plaster on clover to see what the effect is ?

A. Yes, we have tried plaster and found the results beneficial, and it is a very good fertilizer for clover.

MANURING LAND.

By Mr. Erb :

Q. When you spoke of 12 tons to the acre of manure, did that apply to the experimental plots or the field plots ?

A. It applied to the experimental plots. Our experimental plots are limited to three large fields. Two of these are required each year for the plots of cereals, and the other is used for field roots, Indian corn and potatoes. The manure, 12 tons to the acre, is applied for the latter crops, as they can all be hoed and the ground thus kept clean, and the land is left thus in good condition for the two grain crops which follow.

Q. I was out on the farm the other day and noticed a field west of the orchard which looked as if it was being got ready for corn ?

A. With many small heaps of manure on it ?

Q. Yes. I should judge that there must have been about 25 tons of manure to the acre.

A. That field is manured, as near as can be estimated with about 18 to 20 tons to the acre. That is part of the five years' rotation.

Q. That is being got ready for corn and roots ?

A. Yes. The manure is all fresh from the barnyard and looks more bulky than where it has been allowed to stand a while. We find it more economical to use the manure in a fresh condition.

PREVENTIVES TO SMUT IN WHEAT.

By Mr. Lang :

Q. Do you ever have smut in your wheat ?

A. Yes, to some extent. The variety of smut we have here is what is known as smut, and may usually be prevented by soaking the grain in a solution of formalin.

By the Chairman :

Q. You prefer formalin to bluestone ?

A. Yes, this form of smut is different from the bunt smut or stinking smut in wheat. For that sort of smut bluestone is the best remedy.

By Mr. Wright :

Q. I was at the farm one day when you were putting some oats in your silo ; how did it turn out ?

A. Very well. Mr. Grisdale, the agriculturist, who has charge of that branch of the work, will probably appear before the Committee later, and will then give you full particulars about it.

CROP ROTATION.

By Mr. Cochrane :

Q. You have a five year rotation ?

A. Yes.

Q. Can you tell the Committee what it is, beginning this year with corn ?

A. This year, a hoed crop, corn and field roots ; next year, grain, seeded with clover and timothy ; third year, clover, hay or pasture ; fourth year, hay or pasture ; fifth year, grain with ten pounds of clover seed per acre, clover to be turned under with the manure for the hoed crop the year following.

CLOVER AS A FERTILIZER.

By Mr. Cargill :

Q. I infer, from what you say, that 12 pounds of clover seed sown in the spring with the grain, and the crop turned under in the autumn, is equivalent to 10 tons of barn-yard manure ?

A. It is scarcely equivalent in every respect. In the amount of nitrogen added to the soil it is no doubt quite equal in its good effects to 10 tons of manure, and the quantity of humus it gives to the soil is probably greater. Humus is a very important constituent of soils, as it enables a soil to hold more water and furnishes other conditions favourable for plant growth. All plants take up their food in solution in water, and where a sufficient quantity is present in the soil, they build up their structures in favourable weather very fast. We are all familiar with the sponge. If you soak it in water and then hold it up, there will be a steady stream run from it, gradually diminishing until it will cease to drip, but even then there is a lot of water in the sponge, as you will find when you squeeze it. That is a simile which is often used to describe a soil well supplied with humus. It holds a considerable quantity of water stored throughout its substance, furnishing conditions very favourable to plant growth. A well-grown mat of clover from a spring seeding furnishes the soil, when it is ploughed under in the autumn, with a large quantity of nitrogen and much humus. The clover also takes up from the lower depths in the soil, which the shallower root systems of other plants do not reach, supplies of phosphoric acid and potash, so that the clover is practically an enricher of the soil in these elements also. The clover is a most useful addition to the soil, and where farmers cannot get as much manure as is needed, they can add much to the stock of plant food in their land by the ploughing under of clover.

Q. I have been telling my farmers—we have some rich farmers—rich farmers who have been feeding stock, making manure and growing large crops; they have facilities for stabling stock, but our poor farmers have not—and I have been quoting you as an authority that it is beneficial to use clover to seed down with every crop of grain that is sown. I myself sow clover with every grain crop, and I advise farmers to do the same thing. And another reason for that is, of course, that in the early settlement, when the soil was in the virgin state, it would grow any sort of crop, and the people were healthy and prolific, and had large families, and could get labour cheaply. To-day everything is different : farm labour is scarce, and I want to know if seeding clover is as economical as a fertilizer as barnyard manure, for, if so, it would be well for all our farmers to adopt it ?

A. It is useful and economical, but it will not entirely take the place of barn-yard manure. It is economical, because the farmer gets for the expenditure of about one dollar and a quarter an improvement in the quality and crop-producing power of his soil which would cost him ten times that sum to bring about in any other way.

By Mr. Kaulbach :

Q. We thus see that where a man is poor and has little manure, he substitutes clover to get his fields into condition ?

APPENDIX No. 2

A. Yes, and he can thus feed stock and make more manure, and build up his farm by this practice.

SPELT WHEAT.

THE WITNESS.—Now, Mr. Chairman and Gentlemen, if we have finished with the clover subject, I would like to bring before you a few facts regarding Spelt wheat. This is a comparatively new grain to most of our farmers, but it has long been cultivated in Europe. The variety introduced into Canada of late years under the name of Spelt wheat is not a true Spelt, but is known in Europe as the common Emmer.

The Emmers are easily distinguished from the Spelt by the form and character of the head. The Common Emmer is the variety which has become generally known among the farmers of Canada as Spelt wheat. Besides this, there is grown in Europe the Ufa Emmer, which closely resembles the Common Emmer, White Emmer, Red Emmer, Double Emmer, and the Long Emmer.

Of the true Spelts we have Red Spelt, Black-bearded Spelt, White Spelt, White-bearded Spelt, and Smooth Spelt. All these varieties have been grown on the central experimental farm, and I have samples of the heads here for your inspection.

By Mr. Kaulbach :

Q. From what does Speltz derive its name ?

A. I could not answer that. It is commonly known as 'Spelt' in England, but here the German way of spelling the name has been commonly adopted, so that it has become known as 'Speltz'. It is mentioned in the Bible, in Genesis, as 'Spelt' It is also said to have been grown by the ancient Egyptians. With reference to its hardiness and its ability to grow and produce a crop on poor ground, it somewhat resembles rye. Both the Spelt wheats and the Emmers are grown in Europe in mountainous districts, where the land is very poor, and they give returns where the ordinary varieties of wheat would scarcely give a crop worth harvesting.

By Mr. Bell :

Q. Is it grown in France ?
A. Yes, in France, Germany and Russia.
Q. Do you know if it bears the same name in all these countries ?
A. In Germany the variety we have grown here is called Emmer.
Q. Is it called Speltz in France ?
A. It may be, but I am not sure of this.

By Mr Wright :

Q. Is it good for feed ?

A. Yes, we have found it useful for that purpose. You will observe, from the examples submitted, that the true Spelts have a very long and open head and the spikelets project. The kernels are more rounded and fit into the stem much the same as our ordinary wheats do.

RELATIVE VALUE OF EMMER AND SPELT WHEATS.

The relative value of these different sorts of Emmer and Spelt depends largely on the proportion of husk they have. In ordinary threshing very little of the grain is liberated, most of it still remains in the hull.

Although we have no results of analyses at hand, it is altogether probable that the hulls, in common with those of the oat, have a low feeding value.

The proportion of hull to grain has been carefully determined at the Central Experimental Farm with the following results :—

Common Emmer	22·4 per cent.
Red Emmer	22·6 "
White Emmer	23·9 "
Long Emmer	25·5 "
Double Emmer	27·6 "
Ufa Emmer	29·2 "

The proportion of hull in the different sorts of true Spelt tested, was as follows :—

White-bearded Spelt	27·5 per cent.
Black-bearded Spelt	28·7 "
Red Spelt	29·6 "
Smooth Spelt	32·4 "
White Spelt	38·1 "

It will thus be seen that the different sorts referred to vary in proportion of hull to grain from 21·4 per cent to 38·1 per cent.

By the Chairman :

Q. Less than the oats ?

A. Yes, the Emmers give a less proportion than the oats. Some writers, when comparing the yields of Emmer or Speltz with other wheats, have taken the measured bushel of unhulled grain, which usually weighs from 32 to 34 pounds, and compared it with clean wheat weighing 60 pounds or more per bushel. Under such comparisons the Spelt wheat shows up well in bushels per acre, but such a method is manifestly unfair to the wheat. Others have taken the grain, weight for weight, that is, 60 pounds of the unhulled Speltz for the bushel, with 60 pounds of clean wheat. This, although a fairer method than that of taking the measured bushel as a standard of comparison, is still unfair to the clean wheat. The just method would be to deduct from the weight of the Speltz about 25 per cent for the weight of the hull and then make the comparison with the clean grain. The yield of Speltz, or more correctly Emmer, at the several Experimental Farms in 1902, taking the grain with the husks at 60 pounds to the bushel, has been as follows :—At the Central Farm, 30 bushels per acre ; at Nappan, 43 bushels 20 pounds ; at Brandon, 34 bushels 40 pounds ; at Indian Head, 40 bushels 20 pounds, and at Agassiz, 37 bushels, the average of the crop at all the farms being 37 bushels 4 pounds. If 25 per cent be deducted for the hull, we have an average of 27 bushels 48 pounds per acre, which in feeding value is probably equal to about 35 bushels of barley per acre.

I say probably, because we have no satisfactory analyses yet of the grain of the Emmer or Spelt, but I think there is not much doubt that these wheats have more albuminoids and are more rapid flesh-formers than barley.

By Mr. Sproule :

Q. What would be the per cent of feeding value, as compared with the same number of bushels of ordinary wheat ?

A. It is probable that it would be about the same. That, however, can only be determined by further experiment.

By Mr. Cargill :

Q. How does it compare in value with pease ?

A. That has not yet been definitely determined.

APPENDIX No. 2

By Mr. Wilson :

Q. It is only fit for feeding cattle ?
A. It has been used in this country for feeding both steers and hogs.
Q. Not for flour ?
A. I do not know of any instance where it has been used for flour in this country.

By Mr. Richardson :

Q. Is this the grain from which the black bread is made ?

A. That, I think, is made chiefly from rye, although there may be more or less of this mixed with it. I am not familiar with the manufacture of that form of bread, but I know that in the North-west Territories I occasionally meet among the Hungarians and Russians with bread quite dark in colour which I have understood was partly rye and partly inferior flour. It is no doubt nutritious, because the people who feed on it are strong and vigorous, perhaps more healthy than those who feed on more choice forms of cereal products.

Q. It is the main bread used by the people in the north of Europe ?

A. The results of our experiments with Spelt and Emmer wheats have not indicated that they are of any great value to us in this country, where we can grow the finest class of wheat and the best varieties of barley. Barley can, I think, be grown in most localities to greater advantage for feeding stock, and in districts where peas are not very subject to the bug, these also can probably be grown with more profit than the Spelt. Some claims have been made in favour of Spelt on account of the straw, which is said to be more valuable for feed purposes, as the straw is slender in its growth. I think it would be eaten more readily by cattle. It is, however, more liable to lodge.

The CHAIRMAN.—If you will allow me, I would like to say a word about Spelt in the North-west. We had ten acres last year of very fine crop ; the yield was most satisfactory all round. A man in our district who has grown it for several years is very much in favour of it, and it has been found that in fattening steers and sheep that Spelt fed three times a day without hay did remarkably well.

Mr. WILSON—I suppose any grain would do well and produce good results, if fed three times a day ?

The CHAIRMAN—Three sheaves a day is not very heavy feed. Stock eat it very readily, and horses will eat it, too. Still it is growing in favour, and I must certainly say that in our district in the North-west it is becoming a favourite.

Mr. WILSON.—Would you prefer it to oats for feed in the sheaf ?

The CHAIRMAN.—I think I would prefer oats for horse feed.

By Mr. Robinson (Elgin) :

Q. You introduced a variety of spring wheat called "Preston" ?
A. Yes.
Q. With what result, last year ?

A. As I propose to take up the subject of wheat at the next meeting, and have, I fear, already occupied the full time, I will, with your consent, defer my remarks on the Preston wheat until then.

HOUSE OF COMMONS,
ROOM 34,
FRIDAY, June 12, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10.45 a.m., the Chairman, Mr. DOUGLAS, presiding.

Dr. W. Saunders, Director of Dominion Experimental Farms, again attended, at the request of the Committee, and submitted the following evidence :—

MR. CHAIRMAN AND GENTLEMEN,—I desire to lay before you this morning the results of the experiments which we have been making at the Central Experimental Farm, and at the branch farms, in connection with the raising of wheat, the production of new varieties, and the determination of the relative qualities of the different varieties. Although wheat is not relatively so important a crop, nor does it cover so large an acreage in Ontario as oats, it is in Manitoba and the North-west much more important, and when we consider the rapid settlement now going on, which will be followed by the breaking up and cultivation of large areas of fertile land in the Canadian North-west, and the unlimited possibilities for the production of this valuable cereal there, its relative importance among the agricultural products in this country must in the near future be very great. Hence, every encouragement should be given to the growing of the most productive varieties of wheat, of the highest quality, so that farming in the North-west may be made so remunerative as to attract settlers from all parts of the civilized world.

By Mr. Ross (Ontario) :

Q. As a matter of fact, is not Manitoba No. 1 hard the finest wheat in the world to-day ?

A. I think it is, and I hope I shall be able to bring before you presently some evidence in regard to that point.

THE WHEATS OF THE WORLD.

The wheats grown throughout the world consist mainly of five different species and their varieties. *Triticum vulgare,* in which are included most of the spring and winter wheats cultivated in America, Great Britain, and in many of the European countries, and in Australia, for the making of bread. *Triticum durum,* a class of wheats which are known as hard wheats, not in the sense in which we use that term in this country, but in the sense in which it is used in Europe. This includes some hard ricey wheats, represented in this country mainly by a variety known as Goose wheat, which is a valuable wheat for macaroni and pie-crust, and is used in some countries for bread. This class also includes Roumanian, Greek Summer and other sorts. There are very large quantities of these wheats grown in Southern Europe, and recently the United States Government has encouraged the growing of them in many parts of the Western States, and has imported large quantities of seed and distributed it, during the last two or three years, so as to ascertain where it can be grown to greatest advantage, so that sufficient quantities may be raised in America for the making of macaroni to supply the home consumption.

Q. Is the American designation of these wheats macaroni wheat ?

A. Yes. and they are being distributed as macaroni wheats.

APPENDIX No. 2

By Mr. Henderson :

Q. Do we produce a surplus of that wheat which is used for macaroni ?

A. Yes, so I understand.

Q. Where is it sent ?

A. I am told it is sent to Europe. There is a growing demand for macaroni wheats in Italy and France, and although our millers and grain-buyers have discouraged the growing of these wheats in Ontario, our farmers have found that they are less liable to rust, are more vigorous in growth, and on the average will give a heavier crop than most others, and they have been content to take a lower price rather than give up their cultivation. In the earlier period of the cultivation of Goose wheat it was sometimes as much as 10 cents a bushel less than other wheats, but of late years it has brought nearly the same price.

By Mr. Ross (Ontario) :

Q. I think we should discourage the Goose wheat, because it is getting so mixed with our soft wheat, our Ontario wheat, that it is not so profitable to ship.

A. I did not know there was any trouble of that sort.

Q. We do not use it for flour in this country.

A. Another of the wheats grown in the world is that known as *Triticum Polonicum,* or Polish wheat, which in quality is much like the varieties of *Triticum durum.* It produces large kernels and large loose heads, and the grain is hard and ricey, like Goose wheat.

By Mr. Stephens :

Q. Are these all spring wheats ?

A. Yes. The Polish wheat is usually a light cropper. The fourth class of wheats are those known as Emmers (*Triticum Dicoccum*). These in some respects resemble our rye. They adapt themselves to the mountain regions and succeed where the soil is too poor to grow better sorts of wheat. There are also the Spelt wheats, *Triticum Spelta,* which are distinct from the Emmers. These five classes include all the varieties of wheat grown generally throughout the world.

The origin of the wheat plant is unknown. There does not appear to be any reliable records of any of the varieties having been found growing in a wild state, but some of them have been in cultivation since very early times. The earliest mention of wheat in the Bible is in Genesis, chap. 30, v. 15. The Spelt wheats were grown by the ancient Egyptians and are still much cultivated in some of the mountain districts in Europe. The importance of the wheat crop may be gathered from the quantity produced and consumed in the world. It is certainly the most important of all the world's crops and the most valuable to mankind of all cereals. The total crop for the entire world in 1902 is given as 3,124,422,000 bushels.

The crop of wheat in Canada during 1902 was very satisfactory. In Ontario, 748,592 acres were occupied by winter wheat, which gave an average return of 26 bushels 8 pounds per acre, as against 20 bushels 3 pounds, the average of the past twenty-one years. Spring wheat occupied 303,115 acres and gave an average return of 20 bushels to the acre. The average crop for the past twenty-one years has been 15 bushels 7 pounds.

By Mr. McCreary :

Q. Have you there the amount of bushels of spring and fall wheat produced in Ontario ?

A. I have only given the acreage and yield. This would figure out about 19½ million bushels of fall wheat, and a little over 6 million bushels of spring wheat. In Manitoba, the acreage in wheat was 2,039,940, giving an average of 26 bushels per acre, or over 53 million bushels. In the North-west Territories, there were 585,576

acres under this crop, with an average return of about 25 bushels per acre, producing nearly 14½ million bushels. The wheat crop in Quebec and the Maritime Provinces, although growing in volume, occupies as yet only a small proportion of the acreage under cultivation.

The harvest weather throughout Canada was generally favourable, and the crop was well saved, and a large proportion of it has been of a high grade of quality. The wheats of the Canadian North-west, on account of the large proportion of gluten they contain, are now in great demand among the millers in different parts of the world for mixing with inferior and more starchy grades, so as to bring the flour they make up in quality to the standard required.

RESULTS OBTAINED FROM TEST GROWING OF WHEATS.

At the experimental farms persistent efforts have been made for many years to find out those sorts of wheat which are most productive and most profitable in this country, in order that their growth may be encouraged. Seventy-one varieties of wheat were tested at all the Experimental Farms in 1902, in the uniform test-plot experiments, in order that we might discover which were the most profitable for growing in this country. At Ottawa the average yield of all these varieties has been 36 bushels 26 pounds per acre, and the average of the 12 most productive sorts, 42 bushels 33 pounds per acre. At Nappan, N.S., the best 12 sorts have given an average of 52 bushels per acre. At Brandon the average was 37 bushels 4 pounds, and at Indian Head, in the North-west Territories, the average was 45 bushels 58 pounds per acre. The average crop of the best 12 varieties at all the farms was 42 bushels 41 pounds per acre, while the average return given by the whole of the varieties which have been under trial, at all the farms, was 37 bushels 33 pounds per acre.

Of the varieties which have been under trial for eight years, the highest average has been given by the Preston, which stands at the head for yield, having given an average of 34 bushels 59 pounds per acre, taking into account the eight years' trial at all the Experimental Farms in the Dominion. Next comes Goose wheat, with an average of 34 bushels 14 pounds, followed by the Rio Grande with 33 bushels 59 pounds. The Huron gave an average of 33 bushels 37 pounds, and Wellman's Fife an average of 33 bushels 36 pounds. The White Fife has given an average of 33 bushels 23 pounds, and the Red Fife, 33 bushels 16 pounds. Although the Red Fife has given a very good average yield, it has not come quite to the top in these experiments. As a rule, it is remarkable for its productiveness, and for its high quality, and for its power of adapting itself to all sorts of conditions of soil or climate. This wheat originated about fifty years ago. In the *Canadian Agriculturist* for 1861 the following account of its origin was given :—

'About the year 1842 Mr. David Fife, of the township of Otonabee, Canada West, now Ontario, procured through a friend in Glasgow, Scotland, a quantity of wheat which had been obtained from a cargo direct from Dantzic. As it came to hand just before spring seed time, and not knowing whether it was a fall or spring variety, Mr. Fife concluded to sow a part of it that spring and wait for the result. It proved to be a fall wheat, as it never ripened except three ears, which grew apparently from a single grain. These were preserved and although sown the next year under very unfavourable circumstances, being quite late and in a shady place, it proved at harvest to be entirely free from rust when all wheat in the neighbourhood was badly rusted. The produce of this was carefully preserved and from it sprung the variety of wheat known over Canada and the Northern States by the different names of Fife, Scotch, and Glasgow.'

From this it would appear that the Red Fife wheat has been in cultivation for over half a century without showing any tendency to deterioration. It seems to be as good a cropper and as high in quality as it ever was. It was taken from Ontario to Manitoba and the North-west Territories, where it has evidently improved in quality, and as grown there it stands higher in the estimation of millers for the manufacture of flour than probably any other known variety.

APPENDIX No. 2

EARLY RIPENING WHEAT.

By the Chairman :

Q. Why is it that they make a reduction on the price of White Fife over Red Fife of about 2 cents a bushel ?

A. The buyers may make that difference in price but there is not quite that difference in actual value.

Q. White Fife, of which I have had considerable experience, has given excellent crops and is not so liable to be injured.

By Mr. McCreary :

Q. If you ask the Minneapolis miller he will tell you the reason of the reduction in price.

A. I hope presently to bring before you the opinions of one of the best milling experts in Minneapolis on this subject. While the Red Fife is so excellent a wheat, it is, however, open to one objection, that it is rather late in ripening and during the past fifteen years we have had several seasons when early frosts have injured the grain so as to reduce its value very materially. Whenever this has occurred a great outcry has arisen from the North-west farmers, who have suffered, for an earlier ripening wheat.

In the endeavour to meet this demand varieties have been brought into Canada from many different countries which have been grown alongside of Red Fife, and their periods of ripening carefully watched and recorded. Some wheats have been brought from the colder districts in Northern Russia and other northern parts of Europe, some from high altitudes in India, as high as 11,000 feet in the Himalayas ; others from Australia and Japan. Both the Russian and Indian wheats have usually ripened in a shorter time than the Red Fife, but some have been inferior in quality and others have given such small crops that the growing of most of them has been abandoned.

During the progress of these experiments many cross-bred wheats have been originated, in which the effort has been made to combine the good qualities of two or more varieties, and in most of these Red Fife has entered into the combination. One of the earlier introductions from Russia, known as the Ladoga, which was on an average about a week earlier in ripening than the Red Fife, was crossed with that variety and a number of new sorts produced. One of these, known as Preston, a sample of which is herewith submitted, has exceeded the Red Fife in yield during a test of eight years by an average of 1 bushel 43 pounds per acre. That is taking the average on the five experimental farms for a period of eight years. It has also ripened on an average during the whole of that period, taking the results obtained at all the experimental farms, nearly four days earlier.

Another variety known as Early Riga was obtained by crossing one of the Indian varieties obtained from a high elevation in the Himalayas with a Russian wheat known as Onega, brought from near Archangel, one of the most northerly wheat growing districts in Russia. These were both early varieties but were not very productive. By crossing these, the variety known as Early Riga has been produced, which has ripened the earliest of any wheat we have yet tested. It has given an average return for the past four years at all the experimental farms of 30 bushels 45 pounds per acre, a yield 2½ bushels less than that of Red Fife, but in earliness it exceeds the Red Fife by 8⅗ days, which is a very important matter. These gains in earliness are of very great importance to the country, especially in view of the immense territory we have to the north of the present Canadian wheat fields where in the near future much wheat is likely to be grown. In the Preston we have a gain of 3⅗ days with an average increase in the crop in eight years test of 1 bushel 43 pounds over Red Fife, and in Early Riga, an average gain for four years of 8⅗ days in earliness with an average reduction of 2½ bushels per acre in crop.

The next point of importance to discuss is the relative quality of these wheats from a milling standpoint, and also from the standpoint of the British market. In

determining quality it has been customary to take the Red Fife as the standard of excellence. The methods adopted for determining the quality of wheats by the large mills in Minneapolis are probably the best which have ever been devised. With their enormous daily output the interests at stake are very large, and every effort is made to maintain a uniform character and quality in the flour they place on the market. An expert with several assistants is constantly employed in ascertaining the quality of the different lots of wheat purchased. Small mills have been constructed in which the samples of grain can be reduced to flour in a very short time. The proportion of gluten they contain is accurately determined, also the density, colour and quality of the gluten, all of which bears on the character and quality of the flour. Another portion of the flour is made into bread, fermented, and baked in an electric oven at a temperature of 300 degrees F. In this way uniformity in the character of the tests is arrived at, so that an accurate and careful estimate can be made of the relative quality of all wheat purchased for milling.

AN AMERICAN EXPERT MILLING TEST OF CANADIAN WHEATS.

Through the kindness of Mr. L. P. Hubbard, of the Pillsbury-Washburn Flour Mills Company, Limited, I have been granted the privilege of sending samples of our Canadian wheats to be tested by their expert, Mr. J. H. Julicher. The samples sent have all been forwarded under numbers, and no information has been given as to the varieties submitted, or where they were grown. In this case eight samples were sent in the first lot, two each of Red Fife, Preston, Stanley and Percy ; one of each of these samples was grown at Indian Head, and the other at the Central Experimental Farm at Ottawa. In submitting Mr. Julicher's report, I have placed the names of the wheats after the numbers under which the samples were forwarded, so that the readers of the report may know to which they refer.

Wheat Inspection for Wm. Saunders, Experimental Farm, Ottawa.

	Dough.		Gluten.		Quantity.	Quality.
	Quality.	Action in Washing.	Density.	Colour.		
					p.c.	
No. 7. (Red Fife, Ottawa)	White...	Excellent.	Excellent.	White....	11·8	101
" 3. (Red Fife, Indian Head)	White....	Excellent.	Excellent.	White....	11·9	101
" 6. (Preston, Ottawa)	Creamy...	Good	Good....	Creamy White.	11·9	100
" 2. (Preston, Indian Head).	Yellow...	Good. ...	Good.....	Creamy. .	11·9	100
" 8. (Stanley, Ottawa)	Creamy...	Good.....	Good.....	Creamy White.	12·9	100
" 4. (Stanley, Indian Head)	Yellow..	Good....	Good.....	Creamy...	12·4	100
" 5. (Percy, Ottawa)	Yellow...	Good.....	Fair.....	Creamy...	13·3	100
" 1. (Percy, Indian Head)	Yellow...	Good.....	Good.....	Creamy..	12·4	100

The samples marked 1 (Percy), 2 (Preston, I. H.), and 4 (Stanley, I.H.) are good wheats, but the others are better. I would favour 3 (Red Fife, I.H.) and 7 (Red Fife, Ottawa). In my opinion 3, 7 and 8 (the two Red Fifes and Stanley, Ottawa) would be excellent for milling, and bread made from flour of these would be very hard to match for quality, colour and strength.

March 24, 1903. J. J. JULICHER.

These were all classed, as to condition, as very dry.

APPENDIX No. 2

By reference to the table, it will be seen that the Red Fife from Indian Head was sent as No. 3, and the dough of this sample was white and excellent. The gluten also was excellent in density, white in colour ; the proportion was 11·9 per cent, and the quality was 101. One hundred is regarded as good, but this is put at 101.

The Red Fife grown at Ottawa is graded exactly in the same terms, which was a matter of surprise to me, as I had understood that the Red Fife grown in the East was not equal in quality to that which is grown in the West. I am told, however, that the past season was somewhat exceptional in that respect, and that the difference in quality between Red Fife grown in the West and that grown in the East has been less this year than usual, the conditions having been such as to give to eastern samples a relatively higher quality.

By Mr. McCreary :

Q. Where was the seed brought from that was used at the Ontario farm ?

A. We have grown it here for eight years, but the original seed, I think, came from the North-west.

Q. It was the same seed : you did not get fresh seed the year before you sent this sample ?

A. No. There has been no change of seed for the past eight years.

By the Chairman :

Q. May I ask in what year this grain was sown ?

A. These were all of the crop of 1902.

Q. In 1901 the grain in the North-west was soft, I think, and I thought perhaps this might account for it ?

A. These were not from the crop of 1901, but were grown in 1902.

While the dough of the flour of the Red Fife was pronounced white, and the gluten white and excellent, that from the Preston from Ottawa was rated as creamy and good, with good creamy white gluten. The dough from the Preston from Indian Head is said to be yellow and good, and the gluten as good and creamy, indicating a slightly better quality in the Ottawa-grown sample.

Mr. Julicher says that the samples marked '1', Percy, and '2', Preston, Indian Head, and '4', Stanley, are good wheats, but others are better. He states that he would favour '3', that is Red Fife, Indian Head, and '7', Red Fife, Ottawa, and he says, 'In my opinion "3", "7" and "8"'—which are the two Fifes and the Stanley at Ottawa—'would be excellent for milling and bread made from the flour of these would be very hard to match for colour, quality and strength.' The Stanley, to which he refers here, and which he puts with the Red Fifes, is a twin wheat with the Preston. It is graded by Mr. Julicher as a trifle better than Preston, although he pronounces them all to be good wheats, and the reports I have recently had from an English expert, which I will refer to presently on the value in the British market of these several varieties, would go to show that the differences in quality in these several sorts is very slight.

In our efforts in wheat-breeding we are trying to get, for the use of settlers in the North-west, a wheat that will ripen a few days earlier than the bulk of their crop now. If a settler has 200 acres of wheat and has only limited help he has to begin cutting part of the crop when it is on the green side, or his wheat will shell badly before he reaches the end of his harvesting. The part of the crop which is cut first will shrivel more or less, which involves a loss in weight and sometimes in quality, to which must be added such loss as may arise from shelling. If by having fifty to seventy-five acres of an earlier sort these difficulties can be overcome it will be a very great advantage to the farmers of this country and will result in a large saving in the quality and character of the wheat grown.

AN ENGLISH EXPERT REPORT ON MILLING TESTS OF CANADIAN WHEATS.

A similar lot of samples, taken from the same bags, was sent to Lord Strathcona, High Commissioner for Canada, with the request that he would place them in the hands of one of the best English wheat experts for examination. A report on these has only just come to hand. Lord Strathcona says in his letter, which is dated May 27. 'With reference to your letter of the 12th of March, I now forward you the report of Mr. William Halliwell on the eight samples of wheat which you sent me. Mr. Halliwell is the technical editor of *The Miller*. He is lecturer on flour milling to the London County Council, registered teacher of milling technology at the City and Guilds Institute, and may therefore, I think, be regarded as a competent authority. He has, moreover, had twenty-five years' experience of practical flour milling and wheat buying.

I also inclose for your information a copy of the letter Mr. Halliwell wrote when sending me his report.

Mr. Halliwell writes as follows :—

ROOKWOOD, ROMFORD, May 22, 1903.

W. L. GRIFFITH, ESQ.,

DEAR SIR,—I beg to forward you the result of my examination of the eight samples of Canadian wheat you were good enough to send me some days ago.

I have given them special attention from a practical miller's point of view, and I hope you will find the results to be of benefit to Canadian wheat-growers generally. There is an unlimited market for the best sorts of wheat in this country and when my report is published I hope proper emphasis will be laid upon this point. Pure high-class samples will be preferred to those from any other source, as these wheats from the Canadian North-west are constantly growing in favour with the millers of this country.

Yours faithfully,

(Sgd.) WILLIAM HALLIWELL.'

In writing to Lord Strathcona, I told him that it was intended to publish the opinion of the expert for the information of the people of this country, and Mr. Halliwell was asked to prepare his report with this in view. As his report is somewhat technical I will not encroach on the limited time at my disposal by reading it through, but with your consent will have it incorporated in the evidence. I desire, however, to refer to a few points mentioned by Mr. Halliwell in his report.

I may say, first of all, that in the letter written to Lord Strathcona an item of information was given which perhaps in justice to Mr. Halliwell would have been better withheld. I told him that samples 1 to 4 were from the North-west Territories, and samples 5 to 8 were the same wheats grown in Eastern Canada. Mr. Halliwell placed the North-west wheats throughout on a higher plane than he does the eastern wheats, whereas Mr. Julicher, who has a high reputation for his ability, and knowledge of the milling qualities of wheats, practically places the Ottawa Red Fife on a par with that grown in the North-west, not knowing anything at all about where either of them came from.

Mr. Halliwell says that samples Nos. 1 to 4, inclusive, that is Red Fife, Preston, Stanley and Percy, grown at Indian Head, are almost equal, 'There being a just perceptible difference, but not enough, I should say, to make a difference in the general selling price on our English markets.' The four samples of the same wheats grown at Ottawa he ranks somewhat lower in value but says that their general excellence is much better than one would expect from their outside appearance alone. In no case, however, would the latter numbers be sold at the price of those numbered 1 to 4. He puts these Ottawa grown samples in the following order of merit:—

'6' Preston, '5' Percy, '8' Stanley, '7' Red Fife.

APPENDIX No. 2

Further on in his report he seems to reach a different conclusion and alters the relative position of these numbers, when he comes to speak of the price they would bring that day on the London market. He says : 'I have also compared the eight samples with others on the London Corn Exchange, May 21. I have been at the trouble to work them side by side in the examination, and I find that for strength (the ruling characteristic) Nos. '1', Percy, '3', Red Fife, and '4', Stanley, would sell at Mark Lane at 34s. 3d. per 496 pounds; No. '2', at 34s. ; Nos. '5', Percy, and '7', Red Fife, at 33s. 9d., and No. '6', Preston, and '8', Stanley, at 33s. 6d.

The results of these tests and criticisms show that the two cross-bred wheats, Percy and Stanley from Indian Head are, in the opinion of Mr. Halliwell, in every respect equal to Red Fife, taking into account colour, strength, appearance and milling structure. The Preston stands equal to Red Fife in appearance and milling structure, but falls slightly below in point of strength. In the first part of his report Mr. Halliwell speaks of this as a 'just perceptible difference, not enough, I should say, to make a difference in the general selling price on our English markets. But when dealing with the actual values of the samples on the London Corn Exchange, Percy, Stanley and Red Fife are given as being worth 34s. 3d. for 496 pounds, and Preston as worth 34s., which is equivalent to a difference in value of $\frac{3}{4}$ of one cent per bushel.

Again, in his valuation of the samples grown at Ottawa, he puts the Percy and Red Fife first, instead of putting the Preston first, as in the early part of his report, placing these at $1\frac{1}{2}$ cents a bushel less in value, and Preston and Stanley at $2\frac{1}{4}$ cents less per bushel in value than the same wheats grown in the North-west. These estimates of the relative value of these wheats in the London market, coming from so high an authority and a man of so much experience, are no doubt strictly accurate. The differences in actual value are less than one would suppose, judging from the relative prices of eastern and western wheats in this country. I have here for the inspection of the members of the Committee samples of these several wheats. The samples for the Minneapolis expert and for the English expert, also for the Chemist of the Experimental Farms and for the Committee were all taken from the same bags.

By Mr. Stephens :

Q. Is this sample (Preston grown at Central Experimental Farm, 1902) considered to be pure Preston ?

A. Yes.

Q. There is quite a difference in the colour of the grain ?

A. I may say that in many cross-bred wheats we find differences in the colour of the kernel, especially where the kernels of the parents are of different colours. Efforts are now being made to overcome this by separating the two colours before sowing, so as to obtain uniformity in the sample.

Mr. Halliwell's report is as follows :—

Critical examination of eight samples of Canadian wheat :

For strength, as viewed from the outside, from cutting the grains, and from reducing them to powder, I find they come out as follows : The samples are numbered 1 to 8. Four of them (1 to 4) are from Indian Head Farm and are called regular samples of No. 1 wheat. The other four (5 to 8) are from the Government Experimental farm at Ottawa. One to four are almost equal and may be classed as their numbers indicate, there being a just perceptible difference—but not enough I should say, to make a difference in the general selling price on our English markets. Following these I put the experimental samples (from Ottawa) in the following order, namely : 6, 5, 8, 7, and I might add that their general excellence is much better than one would expect to find from their outside appearance alone. In no case, however, would the latter numbers be sold for the price of those numbered 1 to 4. In making this statement, I am bearing in mind that the chief ingredient required in Canadian wheat is gluten or strength. Given that the nature of the wheat also guarantees a maximum of the other attributes which millers expect to find and do find in well

developed Canadian grown grain. Speaking as a miller I also am of opinion that the Indian Head samples (1 to 4) will yield more middlings, of larger and more even size, and of better shape and all round quality than those grown on the experimental farm at Ottawa. There would also be less break flour—a thing all millers try to avoid making, seeing that this quality of breaking flour is only akin to the lowest grade. I may explain this more clearly by saying that the object of all millers is to make middlings first and flour afterwards. Middlings can be purified and so prepared for conversion into the highest grades of patent flour, whereas if the structure of the wheat does not lend itself quite so readily to this performance, but is apt to be too easily disintegrated on the break rolls, the result means flour, and that of a much lower quality, seeing that it cannot be sent to the purifiers at all, therefore I say that according to my judgment, the break flour would be less in the first four samples. Going a step farther, I am of the opinion that the middlings made from the Indian Head samples would grade better—would be more even in size, in texture and in gravity. These are the three primary considerations which govern the successful milling operations, and they are ever present when buying high class wheat for milling purposes. Wheat particles—middlings—which grade well, are always found in the largest quantity at the head of the mill, where the highest priced patent flour is made. The wheats from the experimental farm at Ottawa do not, in my opinion, possess all these qualifications in the highest degree. They are not quite so compact in their structure, or in other words, they are of a slightly more mellow nature and are rather more inclined to break up more quickly, and also into more sizes, smaller sizes in fact, and thus there would be a tendency towards them being conveyed lower down the milling system before being converted into flour. This, of course, means that the larger percentage would be graded as second patents. To my mind, it appears as if the Indian Head wheats were grown under the better natural conditions and in quite different soil.

In the simple matter of flour yield, however, the Ottawa wheats are undoubtedly first, but, as I may be permitted to remark, mere flour yield is not the sole consideration regarding the buying of Canadian wheats. What we require first of all is strength, and given this, yield and colour follow as a natural consequence. When examining the various samples as intended for the purifiers, I still pin my faith to the Indian Head samples. They—as broken up by the millers break rolls—are more free from bran snips, more free from adhering bits of the branny coating, and are thus more easily operated upon, giving to the purifiers a slightly larger constant capacity, and, as I have already pointed out, this capacity is needed on account of the larger quantity of middlings made, yet at the same time, it is the highest recommendation because this larger quantity is to be made into patent or high class flour. Having been through the purifiers, the more compact middlings (Indian Head samples again) go straight to the reduction rolls, and are immediately reduced to flour, whereas whenever there is the slightest mellowness—or weakness I may call it—the flour does not get to the sack quite so quickly. Strictly, however, it is a question of strength, pure and simple, and I have endeavoured to point out my conclusions on that head particularly. Whichever wheat is strongest will get to the flour sack quickest. Patent flour is made where the strength is supposed to be, and when buying strong wheat, millers look to the points I have enumerated.

I have also compared the eight samples with others on the London Corn Exchange at the present time (May 21st). I have been at the trouble to work them side by side in the examination just given, and I find that for strength (the ruling characteristic) Nos. 1, 3 and 4 would sell off Mark Lane stands at 34s. 3d. per 496 lbs ; No. 2, 34s ; Nos. 5 and 7 at 33s. 9d., and Nos. 6 and 8 at 33s. 6d. A comparison with Canadian shippers' figures may be interesting. This will be best made by those more intimately interested.

In order to put my meaning in concise form I append a small table of the various constituents compared with what I find already on the English Exchange.

APPENDIX No. 2

COLOUR MARKS.

Numbers								English Sample.	Maximum Price.	Maximum Marks.
1	2	3	4	5	6	7	8			
									s. d.	
10	9	10	10	9	10	9	10	9	34 3	10
STRENGTH.										
10	9	10	10	9	8	8	8	9		10
APPEARANCE.										
10	10	10	10	8	8	8	8	8		10
MILLING STRUCTURE.										
10	10	10	10	9	9	8	9	9		10

In conclusion, I should just like to add that not nearly enough of the first quality reaches our principal markets. This may of course arise from the fact that most of it is milled in Canada. Our regular samples do not on the whole reach up to the maximum, but may be said to be a shade better than what I found when I mixed several together. It would also be to the general advantage if the grades were kept more distinct and a stricter line drawn between the best No. 1 sorts and No. 1 ordinary. The best is always welcome, will always fetch the highest price, while mixing of any kind whatsoever spoils them for one or other of the points I have just enumerated.

(Sgd.) WILLIAM HALLIWELL.

Q. You regard the difference in colour as due to the nature of the soil ?

A. Not entirely. These differences are not easily explained. Eastern grown specimens are generally more starchy and softer than those grown in the North-west.

By Mr. Maclaren (Huntingdon) :

Q. Why did you not withhold all information as to the origin of these samples as you did with those you sent to the Minneapolis expert ?

A. It did not occur to me at the time, that there could be any objection to giving this information, but I now think it would have been better to have sent the samples without giving any information as to their origin.

By Mr. Robinson (Elgin) :

Q. How much did you send ?

A. Three pounds in each case.

A second lot of samples was sent to Mr. Julicher, of Minneapolis, numbering six in all, two of White Fife, one of which was from Ottawa and one from Indian Head ; one of Early Riga grown at Indian Head, this being the very early ripening wheat to which I have already referred, a cross of Onega with Gehun, another was a

sample of Laurel from Ottawa, a cross between Red Fife and Gehun, and two samples of Goose wheat, one from Ottawa and one from Indian Head. The Laurel was sent because it had given an average yield of 33 lbs. per acre in excess of Preston on a 4 years test and 2 bushels 16 lbs. per acre more than Red Fife. Mr. Julicher's report on this second lot of samples reveals an interesting fact in regard to the variety known as Early Riga. He says that a careful analysis has been made of the samples and number 9, that is the White Fife, from Ottawa, and No. 14, which was the Early Riga grown at Indian Head, are varieties of excellent quality. No. 11, Laurel of Ottawa, and No. 12, White Fife from Indian Head, are of good quality. It will be seen that he puts the White Fife from Ottawa higher than the White Fife from Indian Head. He says that number 10, which is Goose wheat grown at Ottawa, is a very poor quality for milling and bread making, and he has the same to say of No. 13, which was Goose wheat grown at Indian Head. Of these two Goose wheats, he would favour No. 13, which was the sample from Indian Head. His report is as follows :—

MINNEAPOLIS, Minn., April 6, 1903.

	Dough.		Gluten.			
	Quality.	Action in Washing.	Density.	Colour.	Quantity.	Quality.
					p. c.	
No. 9 White Fife (Ottawa)	Creamy-white.	Excellent.	Excellent.	White.	11·8	101
No. 12 White Fife (Indian Head)	Creamy.	Good.	Good.	Creamy.	11·1	100
No. 14 Early Riga (Ottawa)	Creamy-white.	Excellent.	Excellent.	White.	14·2	101
No. 11 Laurel (Ottawa)	Creamy-white.	Good.	Good.	White.	11·1	100
No. 10 Goose (Ottawa)	Dark.	Poor.	Ductile.	Dark.	11·4	90
No. 13 Goose (Indian Head)	Dark-yellow.	Poor	Ductile.	Yellow.	12·8	95

The samples marked 9 (White Fife, Ottawa) and 14, Early Riga are of excellent quality; Nos. 11 (Laurel, Ottawa) and 12 (White Fife, Indian Head) are of good quality; but Nos. 10 (Goose) from Ottawa and 13 (Goose from Indian Head) are of very poor quality for milling and bread making, of these two I would favour No. 13 (the Indian Head sample).

In this examination Mr. Julicher puts the Early Riga in point of quality, higher than either of the samples of Red Fife, except that he makes the dough creamy white instead of white. He says it is excellent in the dough, excellent in the density of the gluten, white in colour of gluten, 101 in quality of gluten, and 14·2 per cent in quantity. This gives it about 20 per cent more gluten than the sample of Red Fife from Indian Head. So here we have a wheat which is eight and a half days earlier and higher in quality than Red Fife. It is possible that the season of 1902 may have been specially favourable to the Early Riga, but it is scarcely possible that any difference in season favourable to the production of a high proportion of gluten in the Early Riga would at the same time be unfavourable to the gluten content of Red Fife. This result as to the quality in Early Riga is most encouraging and a gain of eight and a half days in ripening is of the greatest importance, as it may permit of the extension of the area for successful wheat growing a considerable distance northward.

APPENDIX No. 2

By Mr. Larivière :

Q. Do you establish this 8½ days difference on one year's growing ?

A. No. This is the average of four years' test. With the other wheats named it was the average of eight years' trial. The Early Riga has only been grown in these comparative tests on all the experimental farms for four years. In that time it shows a difference in earliness of ripening over Red Fife of about 8½ days, whereas 3⅔ days has been the average gain in earliness of the Preston at all the farms for eight years, when grown alongside of Red Fife. What these advantages may mean in the future wheat growing of this country it is impossible to say, but I regard these as great successes in connection with the important work of producing new varieties of cereals by cross fertilizing.

By the Chairman :

Q. I suppose it will be well that this expert evidence should be put into the report ?

A. I think it is very important that the fullest particulars should be given to the public on this subject, and shall be glad to see that the wishes of the committee are carried out in this respect.

By Mr. Larivière :

Q. Where did you get this Early Riga variety ?

A. It was produced at the Central Farm in Ottawa, by crossing the Gehun wheat which was obtained from a high altitude in the Himalayas, 11,000 feet about the highest point where wheat is grown, with a wheat from the Onega River, in the interior of Russia, near Archangel, very close to the Arctic Circle. These wheats were discarded from our trial plots, because they were low in productive power, but this cross seems to be a great improvement on the parents.

By Mr. Erb :

Q. Suppose you take those samples you have there and mix them, have you any one in your department able to separate them and classify them ?

A. With much care the kernels of some of the varieties might be separated into groups, but in other cases the kernels are too much alike to permit of this being done.

Q. So the ordinary buyer would not be influenced, because it was better ?

A. I do not quite understand what you mean.

Q. I understand you to say that some expert in England said some wheat he examined was worth more than some others on the Mark Lane Exchange. Would he be able to judge by seeing the wheat ?

A. A man of good judgment and great experience in that way would be able, by seeing and examining the kernels, to separate the varieties which were in any way distinct, and pronounce on their value, much as the experts known as tea tasters, can often name the brand and pronounce on the value of a particular tea, or wine tasters can judge of samples of wine. This man with 25 years' experience in buying and milling wheat in London, is no doubt a first class expert in that line.

By Mr. Larivière :

Q. I suppose a miller would have more experience than a buyer ?

A. This man is both a miller and a buyer, and is the technical editor of 'The Miller,' in London.

By Mr. Maclaren (Huntingdon) :

Q. Mr. Erb thinks this difference in the price you speak of is on the bushel.

A. Not so, it is three pence per quarter, 496 pounds. That is about two-thirds of a cent per bushel of 60 lbs.

By Mr. Erb :

Q. Would the ordinary buyer be able to detect this difference ?

A. It is scarcely likely that he would, but where a man has followed this as a business all his life, he attains an aptitude in detecting slight differences which many would not notice.

By Mr. Robinson (Elgin) :

Q. I notice up west with us there is a good deal of mixing of varieties in sowing wheat.

A. That is done, I understand, with winter wheats with the idea of producing larger crops.

ANALYSES OF WHEATS BY THE CHEMIST OF THE CENTRAL EXPERIMENTAL FARM.

Careful analyses have been made of the first eight wheats referred to, also of the Early Riga, by Mr. F. T. Shutt, Chemist of the Dominion Experimental Farms, and the results reached by him closely corroborate those obtained by the Minneapolis wheat expert, Mr. Julicher. Mr. Shutt reports as follows :—

CENTRAL EXPERIMENTAL FARM,
OTTAWA, May 2, 1903.

Report on Wheats—Percy, Preston, Red Fife, and Stanley—Grown on the Experimental Farm, Indian Head, N.W.T., and the Central Experimental Farm, Ottawa, 1902.

These wheats have been submitted to a careful chemical analysis, which included a determination of all the important constituents. The results are given in the accompanying table, which also presents certain data of a physical character, usually taken into consideration in determining the relative values of wheats.

In certain important features, well marked differences are to be observed between the wheats grown at Indian Head and Ottawa. These may be briefly alluded to as follows :—

Moisture : Invariably, the Indian Head wheats have the smaller water-content. Their average is 11·37 per cent, while that of the Ottawa grown samples is 12·40 per cent.

Albuminoids : As the analyses stand, two varieties—Percy and Preston—as grown at Ottawa, show a somewhat higher proportion of albuminoids than the same wheats grown at Indian Head ; in the case of the other two, Red Fife and Stanley—the percentages of this constituent, as obtained from the Ottawa grown samples, do not materially differ from those of Indian Head. The average obtained from the four varieties at Indian Head is 12·24 per cent, and of the same wheats, grown at Ottawa, is 12·64 per cent.

It has already been remarked that the Ottawa grown wheats contain the larger percentage of moisture ; it is, therefore, evident that calculated to a water-free basis, they would all show a higher percentage of albuminoids than those from Indian Head.

Gluten—Wet and Dry : Though intimately allied to the albuminoids present, these results being obtained by mechanical means, do not furnish as accurate a guide to the nutritive values of the wheats as those obtained by chemical analysis. It is of interest and importance, however, to note that they follow closely the albuminoid content, and thus furnish corroborative data as to the greater value, both from the milling and nutritive standpoint, of the Ottawa grown wheats. The analyses are as follows :—

Ottawa Samples : Wet gluten, 36·45 per cent ; dry gluten, 14·67 per cent.

Indian Head Samples : Wet gluten, 35·48 per cent ; dry gluten, 13·68 per cent.

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The foregoing results as to albuminoids and gluten are not such as we should have predicted. Our own investigations in the past have almost invariably indicated that wheats grown in the North-west are richer in this respect than the same varieties grown in Ontario or the eastern provinces, and our results in this matter have received corroboration from those of Professor Richardson, late of the Division of Chemistry, Department of Agriculture, Washington, D.C., U.S., who some years ago made a very thorough investigation into the character of wheats as grown in the several States of the Union, and who was successful in showing that environment—soil, climate, and cultivation—had a great effect upon the composition of wheats. Wheat, of all the cereals, is the most susceptible to the influences of environment, and consequently we may well suppose as a result of an unfavourable season a wheat decidedly inferior to that usually obtained in the locality. These considerations lead the writer to conclude that the present data are somewhat abnormal, and are not to be interpreted as indicating that the environment as at Ottawa is invariably more favourable to a high protein-content than that of the North-west. The probability is that the seasonal or climatic influences last autumn at Indian Head, and probably other parts of the North-west, were not so favourable to the maturation of the grain as usual*

Oil or Fat : The data showing the percentage of this constituent do not call for any special or detailed comment. The average for the Indian Head samples is 2·35 per cent ; that for the Ottawa samples, 2·37 per cent.

Crude Fibre : This constituent practically represents the bran elements. The Ottawa grown wheats show a somewhat higher proportion, but the difference is slight. The averages are : Indian Head, 1·84 per cent ; Ottawa, 2·01 per cent.

Ash : As regards mineral matter, the Ottawa grown wheats show slightly higher percentages than those from Indian Head. The average for the former is 1·83 per cent ; for the latter, 1·49 per cent. This may be an additional indication of the more complete ripeness of the Ottawa grown samples.

In making a comparison between the varieties, judging of excellence chiefly from the albuminoids and gluten content, it is first to be noted that all the wheats are of the same general character, in many particulars almost identical, and would be designated as of first class quality. The amount and character of the gluten indicate clearly their high value for bread making purposes. There are, however, certain differences, and if placed in order of merit, Wheat No. 5, Percy, Ottawa, would stand first, with the same wheat grown at Indian Head (No. 1) a close second. Of the other three wheats, those grown at Indian Head, the order would probably be Red Fife and Stanley, equal, followed closely by Preston. In the Ottawa grown samples these three wheats show extremely small differences—the albuminoid data slightly favouring the Red Fife, while the Dry Gluten content similarly favour the Preston and Stanley.

(Sgd.) FRANK T. SHUTT,
Chemist, Dominion Experimental Farms.

*In comparing these gluten data with those obtained by the miller, the former will invariably be found higher, since they have been obtained upon the whole wheat meal, and consequently contain the elements of the bran and shorts absent in the floor.

In discussing these conclusions with an experienced grain buyer and miller, I am informed that the wheat of last year's crop from certain districts of the North-west is somewhat inferior in quality to that usually produced, and that this may be attributed to a check in the ripening of the wheat, which occurred a few weeks before harvesting, due to low temperatures ; in some parts the freezing point was almost reached.

WHEATS : PERCY, PRESTON, RED FIFE AND STANLEY

Grown on the Experimental Farms at Indian Head, N.W.T., and Ottawa, Ont., 1902

No.	Variety.	Locality Grown.	Weight per Bushel.	Weight of 100 kernels.	Moisture.	Albuminoids.	Fat.	Crude Fibre.	Ash.	Carbo-Hydrates	Gluten.	
											Wet.	Dry.
			Lbs.	Grams.								
1	Percy	Indian Head.	62	2·828	11·50	12·50	2·26	1·79	1·47	70·48	38·10	14·78
2	Preston	"	63½	3·022	11·48	11·63	2·25	1·85	1·68	71·11	31·68	12·34
3	Red Fife	"	62½	3·164	11·44	12·44	2·48	1·86	1·36	70·42	34·68	13·43
4	Stanley	"	62½	3·019	11·08	12·41	2·42	1·88	1·44	70·77	37·48	14·18
5	Percy	Ottawa	62	3·551	12·05	13·56	2·14	2·09	1·91	68·25	41·59	16·64
6	Preston	"	63	3·680	12·22	12·22	2·46	1·83	1·88	69·39	35 93	14·26
7	Red Fife	"	61	3·302	12·79	12·41	2·43	2·02	1·84	68·51	34·35	13·55
8	Stanley	"	62	3·551	12·23	12·34	2·44	2·08	1·71	69·20	33·95	14·22

Laboratory, Central Experimental Farm,
OTTAWA, April 29, 1903.

(Sgd.) FRANK T. SHUTT,
Chemist, Dominion Experimental Farm.

CENTRAL EXPERIMENTAL FARM,
OTTAWA, May 14, 1903.

Report on 'Early Riga' Wheat, grown at Experimental Farm, Indian Head, N.W.T., 1902.

Analysis.

	Per cent.
Moisture	11·09
Albuminoids	13·72
Fat	2·13
Crude fibre	1·90
Ash	1·40
Carbo-hydrates	69·76
	100·00

Physical Data.

Weight per bushel	64 lbs.
Weight of 100 kernels	2·438 grams
Wet gluten	44·07
Dry gluten	16·70

Comparing these results with those of the eight samples reported on May 2, 1903, it will be noted :

1. That as regards moisture-content this wheat is very similar to those from Indian Head already examined. Their average was 11·37 per cent as against 11·09 per cent in the present instance.

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2. That in albuminoids this wheat is slightly superior to the best of the series previously reported on, viz., the Percy. The figures are as follows :—

	Albuminoids.
Early Riga (N.W.T.)	13·72
Percy (Ottawa)	13·56
Percy (N.W.T.)	12·50

As might be expected, the data for the wet and dry gluten are similarly higher than those of the Percy.

	Wet gluten.	Dry gluten.
Early Riga (N.W.T.)	44·07	16·70
Percy (Ottawa	41·59	16·64
Percy (N.W.T.)	38·10	14·78

Not only is the gluten satisfactory as to quantity, but also as to quality. In noting the character of the wet gluten, it was found to be slightly creamy in colour, firm, elastic, and of uniform texture—denoting a 'strong' flour and one eminently suitable for bread making purposes.

(Sgd.) FRANK T. SHUTT,
Chemist, Dominion Experimental Farms.

Ottawa, May 14, 1903.

Mr. Shutt does not find in the chemical analyses quite as large a difference in the proportion of gluten in the Early Riga, when compared with the Percy, as Mr. Julicher gives, but the difference is only a fraction of one per cent. Mr. Shutt found in Early Riga dry gluten, which he says is of very high quality, 16·70, while the Percy from Ottawa is 16·64, and the Percy from the North-west Territories is only 14·78. These have been determined in duplicate by very careful and accurate methods. Mr. Shutt says 'not only is the gluten satisfactory as to quantity, but also as to quality,' in all these three wheats. In noting the character of the wet gluten, it was found to be slightly creamy in colour, firm, elastic, and of uniform texture—denoting a strong flour, and one eminently suitable for bread-making purposes.

DEDUCTIONS FROM ANALYSES OF WHEATS.

From the facts I have submitted, it seems clear that of the samples which have been submitted to these experts, the two, each of Red Fife, Preston, Percy and Stanley, whether grown at Indian Head or Ottawa, are all good wheats for milling and for bread. Mr. Julicher puts the two Red Fife samples first, very closely followed by Stanley, which is a twin wheat with Preston, and contains a higher percentage of gluten than either of the Red Fife samples. Preston stands equal to Red Fife in proportion of gluten, but drops below it a little in point of colour of the dough, the Ottawa sample of Preston standing a little higher in that respect than that from Indian Head in Mr. Julicher's report.

From the chemical analyses of the eight samples first named, Mr. Shutt puts Percy first in point of merit. It is shown to be richest in gluten, which accords also with Mr. Julicher's statement, whilst Mr. Halliwell puts them as just equal with Red Fife. Between Preston and Red Fife, while the Red Fife is graded as highest in quality, the difference is small and the advantage the Preston has of ripening on an average of nearly four days earlier may possibly make up for any slight difference in the grade. Its earlier ripening habit is a great inducement to the farmer to put this variety in as part of his crop, provided he can get about the same price for it. A difference of two thirds of a cent per bushel, the actual difference in value on the English market, according to Mr. Halliwell, would not weigh with the farmer to any

great extent in this case. A proportion of these earlier wheats in his crop would enable him to begin his harvest about four days earlier, which would help him to save all his wheat in good condition, and with less loss either from shrinking or from shelling. In a recent letter from a prominent farmer in Assiniboia, he says : 'There is one thing I wish to say for your information. There are thousands of bushels of Preston wheat sold in the North-west Territories. It is sold as Red Fife. I am informed that nine out of ten buyers cannot tell the difference between Red Fife and Preston. A buyer was asked in W———— his opinion of Preston wheat. He said, 'I know nothing about Preston, I only buy Red Fife.' He was asked if he had purchased from Mr.————, and he said, 'yes, and I gave him the highest figure for his wheat.' He was surprised to hear that it was Preston. I grew Preston wheat this year ; it was shelling out while my neighbour's Red Fife was green and frozen.' There must have been some difference, I think, in the time of sowing or there would not have been that great difference in the ripening. In Mr. Julicher's report on the second series of samples, I desire again to call the special attention of this committee to the high position he assigns to the Early Riga wheat. This report shows that it contains about 20 per cent more gluten than either of the samples of Red Fife, and that the gluten is equal in quality. This high gluten content is associated with a very early ripening habit, averaging, as already stated, during the past four years' trial, about 8½ days earlier than Red Fife. To find a wheat superior in quality to Red Fife, is what one would scarcely expect, but to find that superiority associated with so much earliness is both surprising and highly gratifying, as the originating and cultivating of such wheat will probably lead to an extension of the wheat-growing area in Canada further north than is possible with the varieties at present grown. This great gain in earliness is associated, as I have already pointed out, with a falling off in crop to the extent of two bushels and 35 pounds per acre on an average of four years. While the Preston has given an average on the trial plots at all the experimental farms during a period of eight years of 34 bushels 59 pounds per acre, and the Red Fife, 33 bushels and 20 pounds, the Early Riga has given during the four years it has been under trial an average of 30 bushels 45 pounds. If this wheat on further trial maintains its earliness, quality and productiveness, its general introduction will largely influence the future of wheat-growing in Canada. The outlook is most encouraging, and the results a triumph of the skill of the hybridizer.

In view of the great importance of this branch of the work at the experimental farms, and to provide for its continuance in a larger way, the Minister of Agriculture has authorized the formation of a special division of cereal breeding and experimentation, with Dr. C. E. Saunders in charge. It is the desire of the Minister to extend this work and to provide for its being done in the most careful manner. An important series of experiments has been planned and is being carried out for 1903, and the well known skill of the head of this Division in this difficult line of work will no doubt bring results which will be very valuable to this country. The civilized world is waking up to a knowledge of the immense wealth laid up in the enormous areas of fertile lands within the Dominion of Canada. Their vast extent is but imperfectly understood even among our own people. The investigations of explorers in Northern Ontario have outlined a fertile belt comprising in all about 16,000,000 acres, and this does not include the 1,000,000 acres north-west of Lake Temiskaming. A large part of this land is wooded and the process of breaking up such land is a comparatively slow one.

SOME OF CANADA'S VAST AREAS OF FARM LANDS.

As to the area of land fit for settlement in Manitoba, Assiniboia, Saskatchewan and Alberta, the following figures have been obtained from official sources and may, I think, be accepted as a rough approximation of the areas in question. Manitoba has a total area exclusive of water of 41,000,000 acres, of which it is estimated that

two-thirds, or 27,000,000 acres, are fit for cultivation. Assiniboia has a total area of 57,600,000 acres, of which probably ⅞, or 50,000,000 acres are fit for settlement. Saskatchewan has a total area of 70,400,000 acres, of which about ⅘ are said to be fit for cultivation, giving 52,000,000 acres. Alberta has a total area of 63,400,000 acres, ⅔ of which are said to be fit for settlement, or 42,000,000 acres. From these figures it will be seen that there is believed to be about 171,000,000 acres of land fit for cultivation in Manitoba and the three provisional territories referred to. What proportion of the wide extent of country north and east of these, including the 60,000,000 acres of land in Athabasca, and a large area in the Mackenzie, is fit for settlement, is not yet known, but it is believed that a large portion of that vast country will eventually be settled.

Samples of wheat grown at Fort Vermillion on the Peace River, have been sent to me, some of which I have brought here to show you. This variety was sent under the name of 'Manitoba wheat,' I do not think it is Red Fife, but it weighed 64 pounds per bushel. This was grown 591 miles north of Winnipeg. I have also Ladoga wheat here which was grown at Fort Chippewan and samples of grain grown at Fort Simpson.

By the Chairman :

Q. This seems more like White Fife, after it has been grown a number of years in the country ?

A. Yes ; it has some resemblance to White Fife.

I have a map here and will point out where these samples were grown. This area here (outlining the boundaries of Manitoba and three of the provisional territories) embraces the 171,000,000 acres which I have referred to. This (outlining the boundaries of Athabasca) has about 70,000,000 acres more, of which very little is known. The Mission station at which the wheat was grown weighing 64 pounds to the bushel was at Fort Vermillion on the Peace river, in the upper part of the Athabasca territory. Fort Providence is on the Mackenzie in latitude 60° 70′ and about 710 miles north of Winnipeg. Fort Simpson is still further north, somewhere up towards the middle of the Mackenzie River district, 818 miles north of Winnipeg. This is the furthest point north from which I have received samples of grain. From the facts I have submitted to you, it is evident that the possibilities of wheat growing in Canada are enormous, and large areas of the more northern portions of the country will no doubt furnish a vast amount of land suitable for ranching and mixed farming. I thought you would be interested in seeing the wheats produced at these far distant points, and I am informed now by people who are familiar with that country that while ten or fifteen years ago the few settlers there were entirely dependent on the Hudson's Bay Company for supplies and paid from $10 to $15 a hundred for flour, that now sufficient wheat is raised there to more than supply the home demand. There is a flour mill at Mission River on the Peace river, and appliances for grinding wheat at several other places, so that the flour used by the people residing there is almost entirely supplied from home-grown wheat.

By Mr. Stewart :

Q. Are Preston and Early Riga bald wheats ?

A. Preston is a bearded wheat, but the Early Riga is a bald wheat.

Q. Is the straw good and stiff, does it stand up well ?

A. Yes.

Q. As well as the Red Fife ?

A. I do not think the Early Riga has quite so stiff a straw as the Red Fife, but it stands well. The superintendent of the Brandon Experimental Farm reports it as having a stiff straw while it is said to be medium at Indian Head. The Preston is much the same as Red Fife in this respect.

Q. The stiffness of the straw and how the wheat will handle in the binder is very important.

A. Yes, of course it is, but the Preston is without fault in that respect and I think the Early Riga will also be found fairly satisfactory.

By Mr. Henderson :

Q. Can you tell us with regard to the district where this sample of wheat was grown at the Peace River Mission, which gave 64 pounds to the bushel. During the past ten years how many of these years have they been troubled with frost ?

A. I regret I cannot answer that question, and I do not know where such information could be had as yet there are only a few settlers in that country and they are mostly interested in ranching. They grow enough wheat for their own use, but they have no object in growing it largely because they have no facilities for sending it out of the country.

Q. You are not sure whether or not the country is quite free from frost for wheat-growing purposes ?

A. I am not sure. An expedition has been sent there this season in conection with the Geological Survey, under Mr. James M. Macoun, which will, I hope, give us a much better general knowledge of this country. In the past nearly all we have known about this country has been learned from boat journeys on the rivers ; hence our knowledge is mainly confined to the river valleys. This expedition is to take horses from Edmonton and travel from Edmonton on horseback and camp at different points and explore for a radius of 100 or 150 miles in all directions, and get all the information possible in reference to the country and its possibilities. I hope, when that expedition reports in the autumn, we shall know much more than we now do about the Peace River country. In the meantime, we have an enormous area of land to fill up, of which as yet only 3 or 4 per cent has been brought under cultivation.

CLIMATIC CONDITIONS AFFECTED BY SOIL CULTIVATION.

By Mr. LaRivière :

Q. Do you know that the extensive cultivation that has been done in the Northwest and Manitoba has done a great deal to prevent early frosts and to moderate the climate ?

A. I feel quite satisfied that cultivation has had the effect of lessening frosts, although it is a difficult thing to prove. It seems only reasonable that it should do so. When the prairie soil is broken up and the black cultivated surface is exposed to the heat of the sun, that black soil will absorb a very large quantity of heat from the sun's rays every day and give it out gradually when night comes and the temperature lowers, and the giving out of that surplus heat, which has been absorbed during the day, over a very large surface will no doubt lessen the probability of frost. The area of cultivated land in Manitoba does not yet amount to one-tenth of the whole tillable area, which is not a very large proportion, but so far as one can judge—and I have watched the results for a good many years, and it seems evident that the climate has been tempered in such a way as to make frost of late very much less frequent than in the past, and I think that the danger from frost will be less as the proportion of cultivated land is increased.

Mr. LaRivière.—I may say that that is my experience. I have been thirty-two years there, and I remember that during the first few years we had a good deal of trouble with the early frosts in the fall, particularly in the last week in August. But during the last few years, in the most settled portions of the province, we have heard nothing about these frosts in August, so that the climate must be influenced a good deal by the extensive cultivation now made, and I think, while there might be some objection at present with regard to early frosts in the Peace River districts, when the country is opened up and cultivated, we would have the same results there as in Manitoba and the West to-day.

The Witness.—In confirmation of that, I may say that we have had, within twenty-five or thirty years, much the same experience in the northern portions of Ontario. I re-

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member distinctly that in the counties of Grey and Huron and other adjoining counties in Ontario, frost at that time often destroyed considerable portions of the crops, and if farmers escaped frost in the spring up to a certain time, their crop was considered safe, but frost was always an element taken into consideration by the farmers at that time. Of late years we have heard little or nothing of such conditions. I think this change must be due to the clearing of the land and the breaking up of the dark soil, which absorbs the heat during the day and then gives it off again gradually, as the cooler temperature of night comes on.

WHEAT GROWN IN HIGH NORTHERN LATITUDES.

I might say that these samples of grain we have been discussing, from the Mission on the Peace river, were sown on May 7 and harvested on August 27. This, as I have already stated, is 595 miles north of Winnipeg.

By Mr. Henderson :

Q. That is north of the latitude of Winnipeg ?

A. Yes. Fort Simpson is 818 miles north, and the grain there was sown on June 7 and harvested September 22, indicating that early frosts did not occur there that year. This Fort Simpson wheat weighs 62½ pounds to the bushel. It has a very plump grain, but it has the appearance of being partly frosted. The samples are here for your inspection.

This completes what I had to bring before the Committee in regard to wheat this morning, unless any member desires to ask me any questions.

By Mr. Henderson :

Q. These were samples of Red Fife you have just been speaking of that you got from the far north ?

A. No, in most cases they were Ladoga.

Q. That from Fort Simpson was Ladoga ?

A. Yes, one of the samples from Dunvegan, a mission station on the Peace river, may be Red Fife, it seems to be plumper than Ladoga. At the time when the late Lieutenant Governor Schultz was holding sessions of his commission in reference to the Mackenzie River district I was asked to send to all the Hudson Bay Company posts samples of the earliest ripening wheats to see if they would grow there. I sent Ladoga and Onega, but I considered Red Fife too late in ripening for those districts. I am told that the wheat chiefly grown there now is the Ladoga, which ripens about a week earlier than Red Fife. It makes a yellowish tinted flour, which our millers here, with good reason, object to, as a white flour is what our best customers want. But when one is living so far from civilization as the Peace river, a slight shade of yellow in the flour is not objected to and any wheat which will produce flour of good quality and good flavour is appreciated.

TESTING THE GERMINATING POWER AND PURITY OF AGRICULTURAL SEEDS.

The next thing which I wish to bring before you is the work we have done at the Central Farm in testing the vitality of cereals and other agricultural seeds during the past few months. This useful work, as most of you know, has been carried on, every year, since the experimental farms were established. For the first four years the average number of samples tested was 790 per annum, but for the past twelve years the average number has been 2,015 each season. They have consisted largely of samples of cereals, the vitality of which was doubtful owing to bad harvest weather or to some other unfavourable condition. Many samples of timothy, clover and other seeds which farmers were buying and wanted to know whether they were good, have also been sent for test. The total number of samples which have been tested and reported on since

this work was begun is 29,451. Farmers are invited to send in every year any samples which may be of doubtful vitality through injury in harvesting or storing, so that their germinating power may be determined and their usefulness for seed purposs ascertained. They are also invited to send samples of any agricultural seeds which they propose to purchase, so that their purity and vitality may be known. In 1902, the number of samples tested was 1,830. During the present year the number has been 2,103. Among these there were 131 samples of clover seed, which have averaged 75·7 per cent in germinating power. While many of the samples have gone as high as 80 to 90 per cent, only seven samples have fallen below 50 per cent. Seventy-five samples of timothy have averaged 83·4 per cent, showing that in these important staple seeds, while we may meet with an occasional bad sample, the Canadian seedsmen, as a rule, have supplied farmers with a very reliable quality of seed and most of the samples have been remarkably clean.

Closely associated with this branch of work is the study of the length of time during which grain and seeds of different sorts will hold their vitality. In many instances the decrease in vitality by age is much more rapid than is generally supposed. In 1898, some experiments were begun in this direction by the selection of twelve samples, all vigorous growing sorts and all from the crop of 1897. Each of these samples was placed in a cotton bag and stored on an open shelf, on the shady side of the room in an ordinary office building, midway between the floor and ceiling, where they would get as equal conditions of temperature as could be had. They were kept in this way and tested every year. The samples consisted of three different sorts of wheat, four of oats, two of barley, two of pease, and one of flax seed. The wheats were samples of Red Fife grown at Indian Head, and Preston and Red Fern, both grown at Ottawa. The oats were Banner, grown at Ottawa and Indian Head, one sample of Prize Cluster, grown at Ottawa, and one sample of Scottish Chief, a variety we were growing then, but have since discontinued. This was grown at Indian Head.

In wheat the average percentages of vitality for the three varieties taken from the crop of 1897, during the five years test stands as follows: in 1898, the samples averaged 80 per cent of vitality; in 1899, they averaged 82·3 per cent, a slight increase; in 1900, they dropped to 77·3 per cent; in 1901, to 37 per cent; and in 1902, the percentage of vitality was only 15 per cent. I might say that the 15 per cent of vitality, in 1902, is entirely made up by Red Fern, Red Fife and Preston, having lost their germinating power altogether and not a single kernel would grow at the end of five years. So you see the stories of wheat growing which has been taken from mummies cannot be entertained as true, they are probably the result of imposition on the part of Arabs, on too credulous travellers.

In oats the average percentage of vitality for the four samples during the five years' test stood as follows: in 1898, it was 90·2 per cent; in 1899, 93 per cent; in 1900, 72 per cent; in 1901, 67 per cent, and in 1902, 54 per cent. In no instance have oats entirely lost their vitality, yet it has fallen on the average in five years to about one-half. Of barley, two varieties were chosen, one a two-rowed sort known as Canadian Thorpe, grown at Indian Head, and the other, a six-rowed variety, Mensury, grown at Ottawa. The average percentage of vitality of these two barleys during the time they have been under trial has been as follows : 1898, 97 per cent; 1899, 91 per cent; 1900, 78·5 per cent ; 1901, 36 per cent ; 1902, 19·5 per cent. The two-rowed variety has entirely lost its vitality within the last year while the six-rowed have retained 39 per cent, which makes up the average figure given.

By Mr. Erb :

Q. How does the average of the two-rowed compare with that of the six-rowed ?

A. As a rule, the six-rowed run the highest.

By Mr. Henderson :

Q. Would you recommend a farmer to grow last year's wheat, instead of this year's ?

A. I would advise a farmer that it would probably be quite as good as this year's seed for sowing.

Q. It looks better, from that table you have read, the second year than the first ?

A. Yes, it looks better ; but the figures given are only the average of a few samples. We should like to have a much larger number on which to base conclusions. As far as our experience has gone, there is no loss of vitality in grain kept for one year, and a farmer may expect as much vigour in a crop grown from such grain as if it were sown the first year ; but in the third year there is a slight falling off, and in the fourth and fifth years there is a rapid decrease in vitality, so much so as to make them quite unfit for seed. We have tested samples kept over from different exhibitions, and where they have stood over ten years, we have found, as a rule, that they have quite lost their vitality.

By Mr. Erb :

Q. The seeds you have put away, I suppose, were only put in ordinary bags ?

A. In ordinary cotton bags.

Q. You have never tried to see if there was any difference if the seeds were placed in an air-tight vessel ?

A. Most of the samples from exhibitions that I have referred to as having been kept for ten years or more, were kept in bottles. This year we have set aside a large number of samples, so as to extend our knowledge in regard to this line of work in the future, and I hope in a few years to be able to give fuller details regarding this interesting subject.

Q. Have you made any experiments to determine the vitality of root seeds, such as turnips and mangels ?

A. We have not. Two varieties of pease were tested, Daniel O'Rourke and Large White Marrowfat. The average percentage of vitality shown by these two varieties was as follows :—In 1898, 94 per cent ; 1899, 95 per cent ; 1900, 88 per cent ; 1901, 64 per cent; 1902, 64 per cent. A sample of flax was also tested, a single example. This was included in the test I have referred to, and gave, in 1898, 81 per cent ; in 1899, 82 per cent; in 1900, 75 per cent ; in 1901, 49 per cent, and in 1902, 26 per cent ; all bearing out the statement made, that after four or five years there is a rapid decline in vitality.

From these tests we gather, that when any of the varieties of grain or seed referred to are kept over for sowing, they may be expected to be about as high in germinating power and in vigour of growth the second year as they were the first. In the third year there is a slight falling off, and in the fourth and fifth years, a rapid decline in proportion of vitality.

By Mr. Richardson :

Q. Would not the temperature at which these samples are kept be just as likely to injure the vitality as the exposure to the air ?

A. It would be very difficult to answer that in the absence of facts. In the experiments begun this year, we have made good sized mouse-proof boxes with shelves, and put them in a granary, where the temperature is fairly uniform. Other samples have been put in the office already referred to, a building adjoining the greenhouses, and a third lot in the garret of one of the houses on the farm, where they will be exposed to fairly low temperatures during the winter. From tests made under these different conditions we hope to gain much useful information.

By Mr. Leblanc :

Q. We are under the impression down east, that in sowing the same kind of grain for several years in succession, the crop will be inclined to diminish each year, and that if we can possibly get our seed changed, bring it, say, from 20, 40 or 50 miles distant, that it will do much better. I think I can safely say, we have tried it, and the

experience has been that it is better to change any kind of seed, even potatoes. I would like to have further information on this point ?

A. I think that the conclusion you have reached is quite correct. It is the prevailing impression, and I think that impression has been gained from actual experience, but it is a very difficult thing indeed to prove. If a change of seed is made and you get a better crop you cannot tell how much of that is due to the seed, or how much to the condition of the land or to the season, but, where we have a consensus of opinion of farmers all over the world, that such is the fact, it is pretty safe to conclude that that impression is founded on experience. We have, however, experienced exceptions to that rule. We have sent to the North-west and brought seed to Ottawa and sometimes we have not had as good results as we have obtained from grain which has been growing here for a good many years. Possibly a change from such widely distant points may not be as favourable to good results as though the seed came from a nearer district. I think the changing of seeds from one soil to another and from one district to another helps to maintain the vigour and character of the crops to a large degree.

By Mr. Henderson :

Q. We get a different report from the Guelph Agricultural College and even your own reports, demonstrate that the contrary is the fact, that by a constant system of selecting the heads, and continuing the selection year after year and sowing the same grain on the same soil, better results have been obtained. That is my recollection of what we were told here some two or three years ago, and the reports were given to bear out those facts of experiments extending over six or eight years ?

CROP RETURNS FROM SELECTED AND SCREENED SEEDS.

A. That is another aspect of the same subject, but under different conditions. What I have referred to in the remarks I have just made were the ordinary crops of the ordinary farmer. When we get our grain carefully selected by hand, choosing the finest heads and growing crops from such selected seed, year after year, on experimental plots, we have found a fairly steady increase; that is the past four years have given us better crops than the previous four years. How much of this is due to the selection, how much to the better condition of the soil, because we are looking after that all the time, and how much is due to the season will, I think, be impossible for any one to prove. What we want to give is actual facts, and to explain the conditions under which we are working and with enlarged experience we may be able to generalize in the future with much more certainty than we can now.

Q. I do not pretend for one moment that I have ever understood that sowing the same seed grain year after year was a good thing, but that if you make a good continuous selection year after year and picking out always the best heads and getting the very best matured grain as seed grain for the succeeding year, but is it not a fact that at Guelph they published reports that demonstrated that under that selection of seed better results are obtained ?

A. They have, I believe, obtained good results there, from this method, and we have also obtained good results here, but how much of this is due to one agency and how much to another is a difficult point to establish. With your permission I will give you the results with seed from selected heads as compared with screened seed.

Q. I was just going to ask you how many years you have been experimenting in that way ?

A. During the past three years some experiments have been carefully conducted at the several Dominion Experimental Farms to gain information as to how crops from seed of selected heads would compare with those grown from screened seed, so screened as to leave only the plump and well matured kernels. In each case the selected seed has been obtained by gathering the largest heads and the well screened

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seed from unselected grain. Both have been sown alongside of each other, and under similar conditions.

At the Central Experimental Farm at Ottawa, in 1900, eight varieties of wheat were tested in this way ; that from the selected heads produced 32 bushels to the acre, and the average from the screened seed was 29 bushels 7½ pounds, a difference in favour of the selected heads of 2 bushels 52½ pounds. Ten varieties of barley were treated in the same way in that year, and the average from the selected heads was 53 bushels 1 pound to the acre, and from the screened seed, 49 bushels 11 pounds.

By Mr. Bell :

Q. Do you use the whole of the grain from the selected heads, or do you screen that ?

A. We screen the grain from the selected heads and sow the larger kernels. In these tests with barley there were 3 bushels and 38 pounds in favour of the selected seed.

At the Brandon Experimental Farm, in 1900, five varieties of wheat were treated in this way, and from the selected heads there was an average of 20 bushels 8 pounds to the acre, and from the screened seed, 20 bushels 58 pounds, or 50 pounds to the acre in that case in favour of the screened seed. It is probable that the season and perhaps some other factors came in there, which influenced the result. Three varieties of barley were tested the same year, and the selected heads gave an average of 34 bushels 1 pound to the acre, and the screened seed gave 35 bushels 20 pounds, making in that case a difference of 1 bushel 19 pounds per acre in favour of the screened seed. At Agassiz, in the same year, eight varieties of wheat gave, from selected heads, 25 bushels 46 pounds, and from screened seed, 23 bushels 41 pounds, a difference in favour of the selected heads of 2 bushels 5 pounds.

Ten varieties of barley at the same farm produced—

From selected heads	36·31 bushels per acre.
From screened seed	28·2 "

Showing a difference in favour of the selected heads of 8 bushels and 29 pounds per acre.

In 1901, 34 varieties of wheat were sown at Brandon with seed from selected heads, and the same number from screened seed, growing side by side, and the average of the whole gave 9 pounds per acre in favour of the screened seed. From the 34 varieties of wheat the average yield was—

	Per acre.	
	Bushels.	Pounds.
From selected heads	32	39
From screened seed	32	48

In favour of screened grain, 9 pounds.

Experiments in the same year at Brandon with six varieties of barley gave—

	Per acre.	
	Bushels.	Pounds.
From selected heads	32	16
From screened seed	30	32

A difference in favour of the selected heads of 1 bushel 32 pounds per acre.

At Indian Head, in the same year, one variety of oats, Banner, gave—

	Per acre.	
	Bushels.	Pounds.
From selected heads	130	20
From screened seed	122	12

In favour of selected seed, 8 bushels 8 pounds.

Only one variety of wheat was tested in 1901 at Indian Head, that was the Red Fife. It gave—

	Per acre. Bushels.	Pounds.
From selected heads	67	..
From screened seed	59	40

In favour of selected heads, 7 bushels 20 pounds.

At the Farm at Agassiz, eleven varieties of wheat were tested in 1901, and they gave—

	Per acre. Bushels.	Pounds.
From selected heads	42	50
From screened seed	37	46

In favour of selected heads, 5 bushels 4 pounds per acre.

Eight varieties of barley were tested, and they gave—

	Per acre. Bushels.	Pounds.
From selected heads	52	41
From screened grain	51	18

In favour of selected heads, 1 bushels 23 pounds.

In 1902, at the Experimental Farm at Brandon, twenty-eight varieties of wheat were tested, and gave—

	Per acre. Bushels.	Pounds.
From selected heads	31	18
From screened grain	31	3

In favour of selected heads, 15 pounds per acre.

At Indian Head, one variety of wheat, Red Fife, gave—

	Per acre. Bushels.	Pounds.
From selected heads	37	20
From screened seed	32	20

In favour of selected heads, 5 bushels per acre.

In all these experiments the well-screened grain of the same variety was sown alongside of that from the selected heads, and on the same day ; so that the conditions were similar throughout.

SUMMARY OF RESULTS FROM TEST GROWING.

To summarize these results, we find that twenty-one experiments were made with wheat in 1900, and the average increase from the selected heads was a fraction over 5 per cent.

With barley, twenty-three experiments were conducted, and the average in favour of the selected seeds was 10 per cent.

In 1901, forty-six experiments were made with wheats, and the average increase from the use of grain from selected heads was less than 4 per cent.

Fourteen tests were made with barley and the average gain from selected seed was also less than 4 per cent.

In 1902, twenty-nine experiments were conducted with wheat when the average in favour of the selected heads was less than 2 per cent.

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Taking the whole series of experiments, 123 in all, 96 with the wheat, and 37 with barley, covering a period of three years, the average gain from the use of grain from selected heads has been a little less than 5¼ per cent.

This is a large increase and the results obtained should induce many to adopt this practice. Not only does it bring an increase of crop but since only well-developed and typical heads are chosen the variety is preserved true to name and free from foreign admixture.

By Mr. Henderson :

Q. Were these heads selected from the crop of the previous year that was grown on the same land ? Did you continue a series of experiments always selecting from grain produced on the same land ?

A. Sometimes they were selected for several years in succession. The screened grain was usually from the ordinary farm crops. Where the same varieties are grown for a number of years in succession it is the practice to change the soil so that the same land will not be occupied by the same crop oftener than once in three years.

By Mr. Richardson :

Q. Have you made any experiment with screening the grain from the selected heads, first selecting the heads, and then screening the grain.

A. That has been our practice here for some years past. We first pick the large heads, thresh them and screen the seed so as to use only the larger kernels.

By Mr. Robinson (Elgin):

Q. What would be the cost of selecting these heads ?

A. We find that it takes six or seven pounds of plump heads to furnish sufficient screened seed for one of our plots of one-fortieth of an acre. This takes a careful man about an hour. At this rate it would take about four days of a man's time to pick a sufficient quantity of heads to furnish the seed required for an acre of land.

By Mr. Henderson :

Q. If a farmer has to drive twenty-five miles to get a change of seed every four or five years, and if he continues without selecting, he requires to change every four or five years, I presume he would make the selection at about the same cost as it would require to drive away and get a change of seed and pay another farmer five or ten cents a bushel more for it than the market price. To my mind, the cost of selection would be a very trivial thing compared with the advantage derived ?

A. You are quite right, 5¼ per cent is a large increase and it would well pay any one, I think, to go to the labour of selecting the heads in order to get that increase, but unfortunately the labour of selecting heads comes at a time when the farmer wants to get at his harvest and he is very apt to put it off.

MR. HENDERSON:—A man may select two bushels from a ten-acre field of well-matured heads. He sows that two bushels the next year and makes a selection again. Let him continue that for several years, and then he probably has, say, thirty, or forty, or sixty bushels of good grain, and he can sow this sixty bushels that he has obtained from special selection. To my mind, the matter of cost is rather exaggerated, when you compare it with the gain.

By Mr. Beith :

Q. The men, in selecting the heads, would trample down the grain ?

A. Yes, to some extent, but I think the increase of 5¼ per cent well worth looking after. As a matter of fact, in almost every farming community a large proportion of the best seed for that community is provided by a few of the most advanced farmers. It often happens that one man has a dirty field. with weeds which he desires to get rid

of, and he prefers to buy from some neighbour who has a clean farm, and I suppose that out of every hundred farmers in the Dominion there are perhaps five or ten who supply the bulk of the seed, whenever there is a change made in the district, owing to their reputation for having clean farms and clean seed. If these farmers could be induced to take an interest in this subject and to do this work of selecting heads, it would, I think, be an excellent thing for the crops of the country.

DISTRIBUTION OF SEED GRAIN.

I desire to call atention for a few moments to the distribution of seed grain. This useful branch of the work of the experimental farms has been continued and is greatly appreciated by farmers everywhere. When I had the pleasure of appearing before you last year, the distribution for 1902 was in progress. When completed, it figured up 37,408 samples sent out from the central farm and 6,493 from the branch experimental farms, a total of 43,901 samples, or over 70 tons of the very best sorts of seeds obtainable.

I may say, that in distributing this grain, we are very particular to have it clean. First of all, it is passed through a fanning-mill, the best that can be got, so as to leave no weed seeds, and after that, there are many thousand pounds picked by hand, in order to remove any weed seeds or grain of some other sort that may have got into the sample and which cannot be removed in any other way. The greatest care is exercised to send the grain out perfectly clean. Hundreds of letters are received every year from farmers, expressing their gratitude for the samples sent, as in this way they obtain, at no cost beyond their own labour, pure seed of the highest quality. In this way many of them have produced sufficient seed for their own sowing and a surplus to sell to their neighbours.

Last year, over 40,000 farmers received samples of grain for this good work, and there is no doubt that the quality, character and productiveness of seed grain throughout the entire Dominion has been influenced very largely by the placing of these comparatively small quantities in the hands of good men. This work has been done by the farmers, partly for the sake of having good grain themselves, and partly for the sake of having good seed grain to sell to their neighbours at a good price.

During the past eight years, from 1895 to 1902, inclusive, the number of samples distributed annually has averaged 36,684, and the total number sent out since the distribution was begun in 1888, is 387,898, involving the use of over 581 tons of first-class material for this purpose. Of these samples, 338,609 have been sent out from Ottawa, and 49,289 from the branch farms.

During the season of 1903, just closed, the distribution has been somewhat modified. Last year I explained to the Committee that we were carrying on two classes of distribution, one where we were sending out three-pound samples of wheat, barley or oats, and the other where we were sending out eight pounds of oats or ten pounds of barley or wheat. The object of this larger distribution was to supply enough seed for one-tenth acre plots, so as to get a return of the yield per acre in the different parts of the Dominion from these respective varieties. The sending out of a limited number of these larger samples was carried on for three years and did great good in interesting farmers in this work. But it led to some dissatisfaction, in this way : One man would find out that his neighbour had got ten pounds of seed, and he had only got three pounds, and we were suspected of favouritism. This year it was thought best to put the applicants all on the same footing as regards the amount of seed sent out.

By Mr. Henderson :

Q. Do you make them all tens ?

A. Not all tens, but all fours and fives. We could not get the grain in sufficient quantities of pure quality to send out ten-pound samples to all. The size of the plots on which applicants are requested to grow this grain have been reduced from one-tenth

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to one-twentieth of an acre, and we have sent every one, this year, four pounds of oats or five pounds of wheat or barley, sufficient to sow a plot of that size, so that when the returns are made, we may have the particulars of information desired.

The number of samples sent out this season was 29,671. Of these, Ontario got 6,931 ; Quebec, 11,393 ; Nova Scotia, 3,031 ; New Brunswick, 2,637 ; Prince Edward Island, 1,065 ; Manitoba, 1,926 ; North-west Territories, 2,294, and British Columbia, 394.

CORRESPONDENCE.

The correspondence maintained with the officers of the farms by the public is also an indication of the great use which is being made of the experimental farms by the farmers of Canada. This correspondence has assumed very large proportions. At the Central Farm alone, during the past six years, 305,840 letters have been received, or an average of 50,973 per year for the six years. Reckoning the working days in the year at 310, this is an average of 160 letters a day for the whole period. This branch of the work seems to be steadily growing. In 1901, the total number of letters received at all the farms was 59,461. In 1902, the number was increased to 73,317. During the first three months of 1903, from January 1 to March 31, the total number of letters received at the central experimental farm was 27,664, so that the year has made a good beginning in that way. A large number of these are applications for grain, but a very large number, also, are letters asking advice in regard to the treatment of crops and what shall be done at this or that particular juncture. Before the recent rains came, we were getting letters asking what kind of late crops the farmers could grow to advantage to furnish food for their cattle in the autumn. Suggestions on many different topics are asked for and responded to, and thus a constant stream of information is going out from these farms to farmers, helping them in their endeavours to turn their crops to the best advantage and to make their work more profitable. The number of reports and bulletins sent out each year for the past six years has averaged 216,034.

VISITS TO THE BRANCH EXPERIMENTAL FARMS.

During the year, I have made visits to the branch experimental farms, and they have been all carefully inspected. These institutions are doing good work in the several provinces and territories where they are located, and are greatly appreciated. At Nappan, in Nova Scotia, the results of the experiments with dairy cattle, in the feeding of steers and swine, and in the growing of field roots and fodder crops have been very useful to the farmers of the Maritime Provinces. Much useful and helpful information has also been given in the report of the Horticulturist as to the growing of fruits and vegetables suitable for Nova Scotia.

The past year has been a favourable one for grasses and clover, and the cultivated grasses produced abundantly. Wild hay has yielded well. At the Brandon Farm, in Manitoba, 24 acres of Brome grass averaged two and a half tons per acre, while at Indian Head the crop varied from two to three tons per acre. Experiments in the feeding of steers have again demonstrated the value of Brome grass hay in that regard, and experimental work in the growing of grain has also been most instructive and valuable.

At all the farms experiments have been conducted with many different sorts of vegetables to find out which are best adapted to the climatic conditions prevailing where these different farms are located.

Many excellent varieties of fruits have been introduced to the fruit-growers of British Columbia through the work of the branch experimental farm at Agassiz.

By Mr. Boyd :

Q. What success have you met with in the growing of clover in Manitoba and the North-west Territories ?

A. In the growing of clover in Manitoba and the North-west Territories we have found that we cannot grow it in the way it is grown in the east, that is by seeding it down with the grain. The grain during its growth takes all the moisture out of the soil leaving little or nothing for the clover, and the result is that the young plants generally die out before the harvest. We have had, however, much success where the land has been entirely devoted to the clover for a season sowing it generally in the latter part of May. This has been tested in connection with summer-fallow with the object of ascertaining how far the land might be improved in fertility by the ploughing under of clover. These experiments have been carried on for three years, but as yet we are not able to detect any advantage in the ploughing under of clover, simply for the reason that the soil is so filled with plant food, and has such an abundance of nitrogen in it, that the addition of clover is practically without result. The nitrogen and humus given to the soil by the ploughing under of clover will no doubt eventually prove beneficial. It is proposed to continue these experiments, and in 20 or 25 years we may be able to detect a gradual lessening of the crops due to partial exhaustion. There is little doubt that there is a lessening of the crops on land long in cultivation in the Portage Plains, as they do not now produce there as high an average as they formerly did, there is no doubt that in the course of time the rich lands in other parts of Manitoba and in the North-west Territories will be so far drained of its superfluous plant fod that the use of clover may be demonstrated to be exceedingly valuable, as it has been in the older provinces. In the meantime we are trying to get all the information we can as to the best methods of growing clover and the best methods of treating the land so as to get the best possible results from it.

Q. What varieties do you think may be grown there ?

A. The common red clover has succeeded very well, and we have also succeeded fairly well with Alsike.

Q. Possibly you know the impression prevails that the ordinary red clover will not succeed there ? that it gets killed by the frost and is not suited for that country ?

A. Yes, that impression is very common, and it is largely founded on the fact that it has often died out when grown with grain as a nurse crop. It is not likely that clover can ever be treated in the west, as it is in the east by sowing it with grain and ploughing under in the autumn, so as to form a useful addition to the plant food in the soil, but possibly by substituting the clover crop for summer fallow every third year, it may be shown in time that this is a very advantageous plan for the farmer to adopt. Instead of leaving the land in fallow a crop of clover can be grown on it in the spring and turned under in the autumn.

ORIGINATING NEW VARIETIES OF FRUITS ADAPTED TO THE NORTH-WEST.

The experiments we have been conducting in the growing of fruit in Manitoba and the North-west have been continued, and this year I have been able to distribute to 197 different points to people, who are known to be very much interested in this subject, young trees of some of the best varieties which have been produced by cross-fertilizing the Siberian crab. These trees will, I believe, be perfectly hardy in all the settled parts of Manitoba and the Territories. This gives you an idea of the increase in size (illustration produced) which has taken place from the cross-breeding. There is the original crab and of these are the actual sizes of the apples that have been produced, they are large enough to prove useful for the people. They can be used for the making of apple sauce, pies and jellies, although they are not, of course, equal to the apples from Ontario. Other lines of experimental work are being followed in this connection. These improved forms are being recrossed with such apples as Spy, Ontario, King, &c., with the object of increasing the size and improving the quality and keeping character of the fruit. The seedlings from these crosses will in all probability give larger sized fruits. Whether this second crossing will interfere with their hardiness or not has yet to be tested. The first crosses have been tested and have

proven perfectly hardy as far as we have gone. In choosing the points at which they have been placed for test this season the question of altitude as well as latitude has been considered and the locations chosen vary from 700 feet up to 4,200 feet, above sea level. These trees have been distributed to 92 points in Manitoba, 96 in the Territories and to 16 in Northern Ontario. Northern Ontario is entitled to consideration in this way, because farmers there have much the same climatic difficulties to contend with as they have in Manitoba.

By Mr. LaRivière :

Q. Have any attempts been made to cultivate the wild plum tree ?

A. Yes, we have been growing large quantities of these at Brandon and Indian Head and distributing them among the people. Wherever we have been able to find good varieties of the wild plum, we have purchased fruit in the autumn and had them sent to Brandon and Indian Head, saving the seed and planting it. This has been done whenever we have been able to find a good variety.

Q. There are one or two good sorts in my riding, good plums ?

A. I should be glad to have information where they are to be had, so that I may be able to grow young trees from the seed and distribute them among the farmers.

By Mr. Boyd :

Q. Is there any way of crossing these plums ?

A. Yes, we are carrying on similar experiments with plums to those I have described in connection with the apples. There are two species of wild plums in cultivation in this country, the American plum, *Prunus Americana,* and the *Prunus nigra.* The nigra is the form found in Manitoba, and it is also found about Ottawa and in Northern Ontario, but in Western Ontario the other form of plum, *Prunus Americana,* is the prevailing form, and the seedlings of both these forms vary much in colour and quality. These two plums differ in time of ripening, the Americana being considerably later in ripening than the nigra. Both of them are equally hardy. We have tried many varieties of both at the farms at Brandon and Indian Head ; and the American plums seldom ripen, the frost taking them before they are fit for use. The varieties of nigra ripen much earlier and are very useful plums. Occasionally a season occurs when the coming of frosts is delayed, when the American forms of plum ripen well, and then growers are delighted with them, as they are usually larger and better in quality than the plums of the nigra group. Such seasons, however, do not often occur. Our efforts for the last three or four years have been directed to finding the earliest and best forms of the nigra plum, many of which have been grown and distributed among farmers in different parts of Manitoba and the North-west Territories. In most instances these early ripening sorts escape the frosts and give good satisfaction. We are gradually increasing the number of the earlier ripening sorts and eradicating those which are late, but are leaving enough of these latter for further trial. Experiments are also being made in crossing the varieties of nigra with the better forms of Americana.

Some work is also being done with cherries. We are trying to cross the pin cherry, *Prunus Pennsylvanica,* with some of the cultivated sorts. It has been worked on for three or four years without success ; still, we hope eventually to succeed. Satisfactory crosses have been made between the sand cherry and plum.

INQUIRY AFTER CANADIAN FRUITS IN EUROPE AND ASIA.

The attention which has been called to Canada and to the fruits of Eastern Canada of late years has been very gratifying and has led to very widespread information throughout the world as to the quality of our fruits. I have already called your atten-

tion to the fact, that some varieties of Canadian oats have been grown for the last three or four years in Scotland, particularly the Banner, and much interest has been created in favour of Canadian-grown varieties, and there is a large demand in Scotland and England now for seed of the Banner, which is being supplied by our larger seed dealers. These oats are popular, for the reason that they adapt themselves to different conditions of soil and climate more readily than other oats do, and hence give better average results than the best oats they have been growing in the past. A few bags of the best sorts of Canadian spring wheats have also been forwarded to Great Britain, for the purpose of finding out whether any of these wheats are adapted to their climate and whether they can thus improve the quality of the flour made from home-grown wheat.

I was rather surprised, this season, to receive a letter from a large wholesale house in Liverpool, asking me to send some of our best Canadian apple trees to Jaffa, in the Holy Land. There was a fruit-grower there who was cultivating fruits in a large way, and he had heard of Canadian apples and was willing to pay any price in order to get a few young apple trees from Canada. I had a nurseryman forward these trees to Jaffa, through the Liverpool house, and I expect to hear later on that in the Holy Land apples have been established from Canada.

Early this season, I had a letter from one of the northern islands of Japan, inclosing a long list of Canadian apples and pears which it was desired to introduce there, and asking for scions of these different sorts for grafting. There are some good experimental farms now established in different parts of Japan. A letter was also recently received from Port Arthur, in China, from a Russian officer who has charge of tree-growing there for the Russian government, in which he sent a draft to cover the cost, asking to be put in communication with nurserymen here who would send him a supply of these noted Canadian varieties of fruit to test at Port Arthur, in China.

I mention these things to show that the fame of Canada is spreading.

Within the past few days we have had with us the lieutenant governor of the Orange River Colony, in South Africa, who has come to Canada mainly for the purpose of inquiring into our methods of farming and our system of experimental farms. Canada has the reputation in Europe of having the best and most practically helpful institutions of this sort to be found in the world.

Mr. Boyd.—I believe Dr. Saunders' communication in regard to the ripening of the wheat earlier, so long as he can keep up the quality of it, is the greatest success, so far as value to the country is concerned, of anything I have heard in all the addresses I have listened to with so much pleasure from him. To estimate the value of that experiment to Canada would be indeed a difficult thing to do, and I trust it will be continued to the fullest possible extent.

Dr. Saunders.—I am much obliged to the Committee for their cordial expression of thanks. I can assure you that no effort shall be spared in trying to solve the problem of early ripening grain for the northern parts of the Dominion and of producing for the settlers there supplies of fruit that will be sufficiently good to add to the comforts of their homes and assist in making them a contented and happy people.

By Mr. Henderson :

Q. I would like very much indeed if you would continue the experiment of selecting the seeds, which, I understood, had been carried on for some five or six or seven years on the farms, and be able in another year to bring down a report showing the gradual increase, if there is an increase, from seed that has been selected, as compared with the old-fashioned system of changing the seed every four or five years.

A. I shall be very glad to continue these experiments and gather all the information I can for the information of the Committee and submit the facts.

Q. Facts are all we want.

APPENDIX No. 2

Before I conclude, I wish to refer to another instance of the attention which is being paid to the progress of experimental work in Canada. There was recently a half-column reference in the London *Daily Times* in reference to the value of the cross-breeding experiments in fruits which are being carried on in Canada.

Having read over the preceding transcripts of my evidence, I find them correct.

WM. SAUNDERS,
Director of the Dominion Experimental Farms.

FARM PRODUCTS AND FOODS

HOUSE OF COMMONS,
COMMITTEE ROOM 34,
THURSDAY, June 18, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 a.m., Mr. Douglas, Chairman, presiding.

Mr. FRANK T. SHUTT, Chemist of the Dominion Experimental Farms, was present by request of the Committee and submitted the following evidence with reference to the chemical experiments carried on at the Central farm during the past year :—

Mr. CHAIRMAN AND GENTLEMEN,—The members of this Committee, I presume, as formerly, are desirous that I should give some account of the character and scope of the work accomplished during the past year by the chemical division of the Experimental Farm. This I shall endeavour to do; but as this work in all its branches increases from year to year, it becomes necessary for me to place it before you more and more briefly. It will be impossible to treat any subject as fully as I should like to, and of many investigations I shall only be able to speak in outline. However, I shall be very pleased to answer, exceedingly pleased, to answer to the best of my ability any questions relating to this work that may be asked by the honourable members of the Committee.

By Mr. Ross (Ontario) :

Q. Just give us the new things ?

A. Well, I should like first of all to say a word or two regarding the work generally of the division. I may say that it continues to grow in the esteem of the farmers of the Dominion. This, I think, is evident from the ever-increasing number of correspondents, and the larger number of samples for examination received from the farmers. I have prepared the following table which gives in concise form a statement of the samples that we have received for analysis, their nature, and the provinces from which they have been received. It is as follows:—

SAMPLES received for examination and report, November 30, 1901, to December 1, 1902

Samples.	British Columbia.	North-west Territories.	Manitoba.	Ontario.	Quebec.	New Brunswick.	Nova Scotia.	Prince Edward Island.	Total.	Number still awaiting examination.
Soils	12	3	5	100	6	3	25	4	158	21
Mucks, muds and marls	2	1	0	4	4	6	9	10	36	8
Manures and fertilizers	0	0	0	4	0	1	7	4	16	6
Forage plants and fodders	2	15	13	74	5	12	9	9	139	19
Well waters	1	12	10	53	19	3	3	1	102	0
Miscellaneous, including dairy products, fungicides and insecticides	3	4	4	115	4	7	8	2	147	4
Total	20	35	32	350	38	32	61	30	598	58

As to our work in correspondence, I may say that these inquiries give us the means of disseminating much useful information. As heretofore, these letters relate to all matters in connection with practical agriculture, and refer to the treatment of soil, the maintenance of fertility, the composition and use of manures and fertilizers, the nutritive value of cattle foods, and a host of other matters, all more or less closely connected with practical farm work. We consider this correspondence a most valuable part of our work, for it certainly does much to bring the farmers into closer contact with the experimental work of the farm, besides giving information that may prove immediately valuable.

Lectures and addresses on many of these subjects have also been given at several of the larger agricultural, horticultural and dairying conventions in Ontario, Quebec and the Maritime Provinces, and much interest awakened thereby. This 'missionary' work, as it might be called, is no doubt of much value to the agriculture of the Dominion. As far as time permits, we examine the samples sent in by farmers, and to which I have already referred. Since our own experimental work has the first call upon our time, we can only analyze these samples as opportunity permits. However, I may say that we do devote as much time as can be spared to this class of work and that the results are frequently of value to the farming community. Over 500 samples have been reported upon this year.

In all this I think we have very satisfactory evidence that our work is receiving the approbation of the farmers and that chemical investigation as applied to the solution of agricultural problems is being more and more appreciated and valued. This is a very gratifying state of affairs, for in this young and progressive country in which agriculture is so largely followed, it is desirable that our people should early learn the importance of chemistry to the right conduct and advance in farming operations.

RETENTION OF SOIL MOISTURE.

I shall now endeavour to trace the progress of one or two of the principal investigations that have been in hand during the past year. The first to which I shall call your attention is the research that has been carried on for three years past to ascertain the relation of tillage, sod and cover crops generally to the moisture content of the soil. It is perhaps unnecessary for me to dwell here upon the fact that moisture is as important as plant food for the thrift and development of our crop, but I wish to direct your attention for a few moments to a subject of great importance, the conditions under which we can control the soil moisture for the benefit of our crops. For three seasons past we have made a special study of this subject, more especially in connection with the management of orchard soils. The effect of surface tillage, and of the growth of a cover crop, that is clover, on the soil's moisture content, formed the subject of our inquiry, in 1901, and it was shown that by preserving an earth mulch in the early summer months a very large amount of moisture could be conserved for the use of the orchard trees. This is a time when they need a great deal of moisture, when they are making their growth and developing their fruit. We found that from 75 to 150 tons more moisture per acre, (that is, to a depth of 14 inches), can be held in the soil for the use of the trees by simple cultivation, or as we might say, that is simply by harrowing. The mulch of loose dry earth upon the surface, capillary attraction is destroyed and evaporation checked.

By Mr. Boyd :

Q. Professor, what do I understand from that ? Is it that you are able to hold the moisture by harrowing the soil, and keeping it without any crop ?

A. Yes, by preserving an earth mulch we prevent the evaporation from the surface of the soil.

Q. By cultivation ?

A. Yes, that prevents the evaporation of soil moisture, by simply keeping a layer of loose earth upon the surface.

Q. And the same would apply to summer fallowing ?

A. Yes, exactly the same principle. We have shown that much water can be conserved for the crop of the succeeding season by summer fallowing. We obtained results to this effect on our farms at Brandon and Indian Head.

Then, again, by the growth of a cover crop, such as clover, towards the middle of summer, say from the first of July onward, we found that we can utilize and therefore reduce the soil moisture, and at this time of the year (late summer and autumn), this is an advantage in orchards, for it will tend to early ripening of the wood. I might say very briefly that the management of orchard soils as followed by the best fruit growers is usually as follows : The soil is so treated as to conserve the largest amount of moisture during the early part of the season, so that there may be a sufficiency for the development of the new growth and fruit; but as soon as the middle of the summer arrives, a crop is sown—preferably one of the legumes—and this, by using the soil moisture, checks the growth of the tree. This causes the tree to ripen its wood before the winter sets in, and thus its new growth escapes injury. It may be remarked here, incidentally, that we have found that the hardiness of a tree depended very largely upon the degree to which the tree ripened up its wood. If it is kept growing until the late autumn, the wood does not ripen, and it is more or less tender and liable to injury during the succeeding winter. For these reasons, therefore, we seek to furnish the tree with all the moisture it can utilize during the early part of the summer, but as soon as the fruit is fairly well developed we endeavour to check or arrest the growth of the tree by reducing the soil moisture and so induce the ripening process.

By Mr. Sproule :

Q. Before leaving that subject, you said that you preserved from 75 to 150 tons of moisture to the acre by cultivation, does that mean the total amount of moisture in the soil, or is it the excess over the average ?

A. That was the amount over and above that in adjoining soil carrying a crop. There were between 75 and 150 tons more of moisture than there was in the adjoining plot on which a crop of clover was growing.

Q. You did not make any comparison between different crops as to the amount of moisture they abstracted from the soil ?

A. To some extent, and I am going to relate the results of those experiments in a few minutes.

Q. How do you manage to get the clover to grow after the 1st of July ?

A. Hitherto, in this district, we have had very little difficulty. I can only speak from our own experience at Ottawa. Here we usually have an abundant and well distributed rainfall, though we have this year suffered from a severe and long continued drought. Such a drought for this district is not, I believe, within the memory of the 'oldest inhabitant.' As a rule, we have an ample and well distributed rainfall throughout the summer, and we have not any difficulty to speak of in getting a catch of clover about that date—the end of June or the beginning of July.

Q. That is, you cultivate the soil until the middle or end of June, and then you sow the clover seed, and that takes out the moisture ?

A. Yes.

Q. When do you sow ?

A. According to the season, say usually between June 20 and July 15. I wish you to understand that there is no one system that can be carried out alike similar in all particulars for all soils. The character of the soil and the weather (*i.e.*, rainfall) must be taken into consideration. No one sytem of orchard soil management best suited to all districts could be devised, but the general principle to be used as a guide is, that there should be a sufficiency of moisture for the growth of the tree and the development of its fruit during the early part of the season, and the utilization of the soil moisture later in the season, when it is desired to have the tree ripen its wood. The method to be followed in bringing about these conditions very largely depends, as I have said, upon

the nature of the soil and the rainfall that may be expected in the district. The cover crop may be ploughed under as early as possible in the season, and the soil cultivated till, say, the 1st of July, and then sown to clover ; or the cover crop may be left until nearly the end of May (if there is an abundance of moisture) then ploughed under and the soil cultivated till the beginning or middle of July, when, as in the former case, it is again sown with clover. The cover crop system not only allows in a large measure the control of the moisture supply, but also enriches the soil in nitrogen and organic matter, and furnishes protection by holding the snow during the coming winter. In western Ontario, for instance, where there is a possibility of a season of drought in the spring and early summer, it is desirable to turn the crop under very early in the spring, just as soon as one can get on the land, but in this part of the country we leave the cover crop until, say, the third week in May.

Q. What kind of clover do you sow ?

A. We have used the Common Red clover and the Mammoth Red clover.

Q. Which do you prefer ?

A. We have on the whole obtained, I think, the best results from the Common Red, but the result is very often dependent on the character, or the vitality, of the seed. The Common Red, I think, on the whole, is the one the most generally recommended. Of course, with regard to the growth of a cover crop, I should say our object is not only to control the moisture content of the soil but also to enrich the soil with humus and nitrogen.

EXPERIMENTS WITH RETENTION OF SOIL MOISTURE.

In 1902, we obtained data corroborating in all essential particulars the results of 1901, and in addition, some important data from an experiment started in that year to ascertain the amount of moisture in the soils kept cultivated, compared with that in soils allowed to remain in continual or permanent sod. Starting early in April, 1902, with two adjoining plots, the one clean cultivated, the other in two year old sod, both soils having at this time practically the same percentage of water, we found by the middle of May that there was an excess of moisture in the clutivated plot to the extent of 117 tons per acre, calculated to a depth of 14 inches. (All our soil samples in the soil-moisture investigation are taken to that depth). By July 12, this excess amounted to 217 tons per acre. On August 8 it was 196 tons per acre, and on September 20, it was 98 tons. At the close of the season, that is the beginning of November, both soils, cultivated and in sod, were again practically identical in moisture content. That experiment showed that a very large amount of moisture had been utilized by the sod during the growing season. I concluded from these results that it was only in very well watered districts that the practice of keeping orchards in sod could be followed to advantage or could be advised.

By Mr. Smith (Wentworth) :

Q. What depth in inches would you reckon this amount of moisture to be equivalent to ? How much rainfall ?

A. You may assume one inch of rainfall to be equal to 100 tons per acre, practically. It is a little more in reality.

It seems to me that the instances in which it would be advantageous to have the orchard in permanent sod must be exceptional, and especially so when the trees are young.

The samples of soil which I present to the Committee this morning are obtained from the plots just referred to, for we are continuing this experiment during the present season. Owing to the severe drought our work this year furnishes an exceptionally fine illustration of the value of cultivation for conserving moisture.

The soils we examined in 1902 are from the same plots upon which I conducted the experiments last year, that is, a plot under cultivation and an adjoining

one in sod. You will remember that I pointed out that in November of last year the moisture content of the two plots was identical. On May 14, this year, the soil under cultivation contained 12·03 per cent of moisture, and that in the soil of the plot in sod adjoining there was 5·32 per cent. I place before you samples of these soils. There (referring to sample) is a sample of the soil from the cultivated plot, containing over 12 per cent of moisture. Here is the soil from the adjoining plot, only about 8 feet distant, which was under sod last year and this year. It contains but 5·32 per cent water. You will notice the great difference in appearance between them. The former looks moist ; the latter is just like powder. The moisture content of these plots last November was identical, and before May of the present year the moisture in the plot in sod had been absorbed by the growth of the grass and lost by evaporation until it contained only 5·32 per cent. That means that there was less than half the moisture in the soil under sod that there was in the cultivated soil. And this reduction had taken place before May 14. It means a difference of more than 150 tons per acre to a depth of 14 inches simply lost by allowing the orchard to remain in sod. The very severe and long continued drought that we have suffered from here this spring has furnished us, therefore, with an excellent illustration of the effect of sod in drying out a soil.

By May 29 the soil in the cultivated plots contained 14·6 per cent of moisture, and the adjoining soil in sod contained only 5·5 per cent, a difference of over 216 tons of moisture per acre in favour of the cultivated soil. Still later, on June 5, the moisture in the soil under sod had been further reduced to 3·03 per cent. It is this sample that I now show you (June 5) and it is a very striking example of the extent to which the drying out process can be carried. It is almost like powder, and the leaves had begun to wither and fall. I must not take up more time in discussing this matter now, but I thought these samples would interest the Committee. We had such an excellent opportunity this year to investigate this subject, and we shall bring to the attention of fruit-growers the results we have obtained. The importance of soil management in orchards should be widely recognized. It is really one of the most important questions we have to consider to-day in connection with profitable fruit-growing.

By Mr. Erb :

Q. If I understand you right, the cultivation of the soil in the first place saved moisture ?

A. Yes, sir. It is essential that the land be constantly harrowed ; merely leaving it bare would result in the loss of much moisture.

Q. Well, suppose you try this : take a piece of land ploughed last fall and harrowed, and another piece you are tilling all along, would that not show what the tillage conserved ? In this case you speak of, the clover will have extracted much of the moisture ?

A. Yes, it may be. No doubt it did.

Q. But you take a piece of land bare and tilled, and another bare and not tilled, and it would show what moisture was conserved by tillage ?

A. Quite so. No doubt more moisture would be conserved in the soil that was kept cultivated or tilled. Our experiments were on lands bare and tilled or cultivated, and soil in sod. There is more liability of loss from capillarity in land ploughed and not harrowed than in soil kept tilled. By all means keep the earth mulch by constant cultivation.

Q. That shows that moisture is conserved by tillage ?

A. Yes. Our experiments necessarily include also the quantity of moisture utilized by the growing crop. I may say—our data are voluminous, and I am giving you merely an outline—that part of this sod plot was turned under in March and harrowed since, and we find that its moisture content is very little less than that of the cultivated plot, showing it had not suffered as much from the drought as the portion

remaining in sod. This showed that evaporation had been checked by the cultivation of the soil.

By Mr. Stephens :

Q. Do you attribute the moisture as all coming from below or from the atmosphere ?

A. Well, this year we had practically no rain during the season I am speaking of —we had a little but so little that it was measurable only in hundredths of inches— and it was not sufficient to make any appreciable difference in the soil's moisture.

Q. Does not the earth absorb some of the moisture that falls in the night ?

A. Yes, if the temperature of the earth is below that of the atmosphere there is condensation, but throughout that long-continued drought the earth was dry and I doubt if it got any moisture in that way.

By Mr. Stewart :

Q. Had you any dews out there ?

A. No, or at all events very seldom.

Q. I did not notice any in the city.

A. I should say that dew was quite exceptional.

By Mr. Smith (Wentworth):

Q. It is interesting to know what difference there is in the moisture in soils and what difference there is in the moisture which different cover crops would extract from the soil. In our district we use among other cover vrops, the hairy vetch. Some use rye, others clover, others rape and there are various different things to use, and it is a very important matter this you are dwelling on, and it is very important to know, especially in a year when farmers are behind and do not get these crops ploughed under as they are this year, which crop is extracting most moisture from the soil.

A. It is undoubtedly of great importance to them. I have also conducted an experiment as to the moisture content and the amount of moisture extracted by a clover cover crop compared with sod, and I found that a piece of soil in permanent sod will, in seasons of drought or limited rainfall, contain very much less moisture than a piece of similar soil which is growing a cover crop of clover. Therefore, as to the two the permanent sod is very much harder on the moisture content of the soil. The reason we undertook these experiments, is because the practice of many fruit-growers is to have their orchards continuously in sod. I might remark in regard to other cover crops that the horticulturist has an experiment in progress this year using a number of different crops, chiefly legumes for orcharch covers. In connection with this investigation I hope to obtain information as to their fertilizing value and their draught upon the soil's moisture.

Q. Do you notice much difference between rye and vetch ? Rye seems to exhaust the soil more.

A. The amount of foliage in the cover crop controls to a large extent the amount of moisture utilized by the crop from the soil. The larger the amount of foliage the greater the demand on the soil moisture, because the whole of the moisture necessary, probably 200 to 300 tons to the acre, must come from the soil through the roots ; so the more foliage there is the more the evaporation, or rather transpiration.

By Mr. Erb :

Q. I understand you to say the larger the amount of foliage the growing crop has the more the extraction from the soil ?

A. Speaking approximately.

Q. Don't you think clover has more foliage than ordinary sod ?

APPENDIX No. 2

A. It is rather difficult to express an opinion as to that ; much would depend on the number of stomata present. I think the explanation very largely for the greater amount of moisture in soil under a clover cover crop over soil in sod is that capillarity is set up in the sod soil. I think there is a greater loss by capillarity in the land which is in sod than in clover.

By Mr. Smith (Wentworth) :

Q. Why ?

A. Because the ground in sod settles easily into that mechanical condition which sets up capillarity. It then loses moisture easily. I think that is one reason why there is a greater amount of moisture lost from land which is in sod. Another thing, the amount of moisture used by a crop is in a measure dependent on the amount of dry matter stored up by the crop. It is not altogether the amount of foliage, but the amount of dry matter in the plant that regulates the moisture used. There must be a certain amount of water passing through the plant to enable it to store up this dry matter.

By Mr. Robinson (Elgin) :

Q. I notice, Mr. Shutt, that many orchards are kept bare now.

A. The whole year round ?

Q. Yes. You do not recommend that ?

A. No, for if kept bare continuously, it will diminish the amount of humus, the amount of nitrogen in the soil, and the soil will get into a poor condition. Besides, there would be no covering for the roots of the trees in winter—nothing to hold the snow.

Q. You use a cover crop ?

A. Yes, for the protection of the roots in winter, as well as for the other objects I have been speaking of.

HOUSE OF COMMONS,
COMMITTEE ROOM 62,
FRIDAY, June 19, 1903.

The Select Standing Committee on Agriculture and Colonization met here, this day, at 10 o'clock a.m., Mr. Erb, presiding.

MR. FRANK T. SHUTT, Chemist, Dominion Experimental Farms, was present, by recall, and his examination was continued, as follows :—

Mr. Chairman and Gentlemen,—Reverting for one moment to the subject that was under discussion when we adjourned yesterday, as to the value of clover in the management of orchard soils, I wish to say that our field results and the chemical data accumulated in the last five or six years regarding the fertilizing value of clover have been collated and published in bulletin form. It is Bulletin No. 40 of the farm series, and is written by Dr. Saunders and myself. I think the information it contains is of great importance to Canada, and should be in the possession of every farmer living in districts where clover is sown. The whole matter is so fully treated of in this bulletin that I need not occupy your time in discussing, even briefly, the various phases of this important subject. There is no fertilizer so cheap and efficient as clover in districts where clover can be grown, for maintaining and increasing the fertility of the soil.

By Mr. Ross (Victoria) :

Q. Where can clover not be grown ?

A. There are, for instance, certain districts in the North-west where climatic conditions are not favourable to clover, but I might add, in this connection, that at our farms at Indian Head and Brandon we have succeeded in growing it some seasons very well. It is a plant that needs plenty of moisture when young.

By Mr. Smith (Wentworth) :

Q. Have you made any comparison between clover and the hairy vetch ?

A. As to their comparative fertilizing value ?

Q. Yes.

A. We have never made any such comparison between clover and the hairy vetch, but no doubt the hairy vetch is a valuable cover crop. I believe that last year's experimental plot of hairy vetch was destroyed by aphis.

Q. I think Professor Craig claims it has a greater value than clover.

A. I believe so. It is recommended very highly as a cover crop. A cover crop in an orchard has more functions than merely the maintenance of the fertility of the soil.

Q. He says it contains much nitrogen.

A. No doubt it is rich in nitrogen. I never saw any facts, as far as I can recollect, to support the statement that it contains more nitrogen than clover, but of course there may be such data.

Q. Professor Craig is at Cornell, and those are the results they get there.

A. Professor Craig is a horticulturist, and would look at the general value of this as a cover crop. Did he have this plant analysed ?

Q. He gives the actual number of tons of nitrogen in this cover crop.

A. I do not remember having seen the figures. The results in a recent bulletin published by him at Cornell are, I know, for the most part, our own at Ottawa, and were obtained by me when I was associated with him on our own experimental farm. It is quite likely that the results with hairy vetch have been obtained since that date.

APPENDIX No. 2

COMPARATIVE VALUES OF CATTLE FOODS.

We may now briefly refer to certain matters in connection with our examination of fodders and feeding stuffs. It is a very important matter to dairymen and farmers who are feeding much stock to have a knowledge of the concentrates or milling products they find it necessary to purchase. Many of these materials are high priced and consequently it is essential that we should have accurate, definite knowledge of their purity and strength. Possibly you are aware that in this connection I, some years ago, took up the question of the products from oatmeal mills—oat feed, oat dust, oat hulls, &c.,—and showed that while some of them were valuable and had a fairly large percentage of protein and fat, others were practically worthless as feeds. We found certain of them worth say $10 to $15 per ton, while others were not worth more than $4 to $6 per ton, from the feeding stand-point. These results were published in detail in our annual report. Last year, I dealt with the various by-products from corn-starch factories, and more particularly as to their percentages of protein and fat, and presented to you data which gave an idea of their relative feeding value. I showed that the names in certain cases were misnomers, that a material might be sold from one mill which was quite inferior to material sold under the same name from another starch factory. The whole question of these products was then quite fully discussed. The importance to farmers of information of this character is obvious.

During the past year, another matter has been brought to my attention by correspondents, chiefly in Nova Scotia and Quebec. These people, mainly farmers, have begun to use cotton seed meal, a by-product which comes from the Southern States, largely from Florida. It appears that the consumption there of this highly nitrogenous feeding stuff is on the increase. With regard to certain brands lately introduced in that province, doubt is expressed by our correspondents as to their purity. Some of this doubtful meal is sold at a slightly lower price. It is different in colour, and that is probably what gave rise to suspicion. We have examined several samples of cotton seed meal and find there is much difference in their values. For instance, I hold in my hand a bright yellow or light-coloured sample, No. 1, which is priced at $32 per ton. I also show you two other samples which are darker in colour and coarser in character, which, on analysis, I find distinctly inferior to cotton seed No. 1. Their percentages of protein or flesh-forming constituents is much lower, and they also contain less fat. Comparing the value of them, I would say that while the first one (No. 1) was worth in the neighbourhood of $30 per ton, this No. 3 would be not worth more than $20 per ton. It is obvious, therefore, that it is an important matter for our farmers to have a knowledge of these feeds. While the value of certain by-products can be estimated by a farmer accustomed to handling these things, there are many feeds the actual value of which cannot be estimated without chemical analysis.

I do not bring this forward merely to show you the value of our chemical work to practical farming, but to emphasize a statement made to this Committee last year, that I think the time is coming when it will be necessary—to-day it is desirable—that there should be an inspection, a control, a system of examination and analysis in connection with the sale of these concentrated foods. We have it already in the case of fertilizers, which are plant foods. These concentrates are animal foods, and if it is necessary to protect the farmer in connection with the supply of plant food, I think it is just as necessary to furnish him protection in regard to animal foods. In many States of the Union they have laws which compel the sellers of these concentrated feed products to put on each consignment a tag with a guaranteed analysis, showing the percentage of protein and fat which these materials contain, just as fertilizers have to bear tags giving the amount of nitrogen, potash and phosphoric acid which they possess. I look forward to the time—and do not think it far away—when it will be of great advantage for us to have some legislation in the same direction, giving our farmers the information and the protection they require in connection with these materials.

Q. You make one of those more valuable than the other ?

A. In sample No. 1 there is 42 per cent of protein and 11½ per cent of fat, while in this sample, No. 3, there is only 23 per cent of protein (or fleshformers) and 5 per cent of fat ; so we may infer that No. 3 is worth little more than half No. 1. Of course, that fact could not be established without analysis.

Q. How does this difference come ?

A. It is a difference in the method of manufacture of the cotton seed meal in the Southern States. I presume, a proportion of the hulls is left in the meal.

By Mr. Blain :

Q. How does that compare with the starch factory products ?

A. Gluten meal ? You know, there are several kinds of these products. We have gluten meal, gluten feed, corn oil cake, corn bran. The gluten meal from the Edwardsburgh starch factory contains in the neighbourhood of 35 per cent to 37 per cent protein and in the neighbourhood of 5½ per cent to 6½ per cent of fat. Then, there is gluten feed, of quite another character, which contains all the products from the corn except the starch, and which is much lower in protein, containing only about 17 per cent. But the best qualities of cotton seed meal are exceedingly rich in protein, as I have said, about 42 per cent.

By Mr. Kidd :

Q. In the poor quality of gluten products is there any other mixture ?

A. No, there is no admixture with foreign substances, but 'gluten feed' and certain other similar products are inferior in feeding qualities to gluten meal. Of course, 'gluten feed' is a rich, nourishing food—the point is, it is not worth as much as pure gluten meal.

By Mr. Ross (Ontario) :

Q. Is gluten meal a good feed ?

A. Excellent; it contains much protein and a large amount of fat. It is a very useful concentrate. It appears to be largely digestible.

Q. There is a little of it used in our section, not very much, and I have a statement here, made by one of my constituents who lives at Myrtle Station, dealing with its value. It is from S. J. Peacock, and is dated February 6, 1903, to me. He says :

'I took from Arthur Quinn, drover, 20 pigs to feed. The pigs were weighed in and fed on half gluten meal and half Goose wheat chaff. At the end of a week they were weighed. They had increased 350 pounds, which, at 6 cents a pound, amounted to $21 on the lot, the feed for the week having cost $8, making a net profit of $13.'

I thought that was a pretty good record, so I thought I would put it on the minutes.

Mr. WILSON.—Will that be anything like the average ?

Mr. ROSS.—I think I will leave that to Mr. Grisdale.

Mr. WILSON.—I thought you were explaining to us all about this matter.

Mr. KIDD.—What was the weight of those pigs when they were put in ?

Mr. Ross (Ontario).—I presume they were ordinary pigs, hardly ready to ship. I thought the statement of increase remarkable, and I know the man is a responsible man. I do not advise the use of gluten meal and Goose wheat chaff particularly, but thought I would take a memorandum of that and have it put on the minutes. I thought it was a really fair return for the money invested.

Mr. ERB.—Were these pigs just brought in from the farmers, or had they been shipped by rail ?

APPENDIX No. 2

Mr. Ross (Ontario).—They were from the Canadian farmers. I am not offering this in favour of Goose wheat chaff and gluten meal as a food, because gluten meal as a food does not cut any figure in our section. The great food for pigs there is pease and oats, largely so, and any other coarse grain mixed with it, so that these results, when given to me, rather startled me.

CORN AND CLOVER ENSILAGE.

Mr. SHUTT.—Passing on, then, gentlemen, to another subject in connection with this question of fodders and feeding stuff, I should like for a few minutes to call your attention to certain ensilages which have been made on the farm during the past year, mixtures of corn and clover. We are all aware that corn is our staple silo crop, and the probabilities are that its position in that respect will never be disturbed. Nevertheless, we have to recognize the fact that corn ensilage is somewhat poor in protein and that an ensilage richer in this constituent would be of great value to farmers and dairymen. Towards that end, certain ensilages, mixtures of corn and clover, were made by Mr. Grisdale last year. These have been analyzed and their fodder constituents determined, in the laboratory. Clover, as we are all aware, is a material which is very rich in these flesh-forming constituents, but there are practical difficulties in the way of making first-class clover ensilage. I do not mean to say that by attending to certain details these difficulties might not in a very large measure be overcome. Nevertheless, as practical men, we have to recognize the fact that it is not always possible to obtain good clover ensilage. The idea, then, was suggested that clover should be ensiled with corn, and various mixtures were made, the details of which we find in the report for 1902. We made, for instance, an ensilage of four parts corn to two parts clover, with a little sunflower ; of two parts corn and four parts clover ; an ensilage of four parts corn and two parts clover, and an ensilage of corn and clover in equal parts.

By Mr. Stephens :

Q. How do you get clover ready for the silo at the same time as corn ?

A. That was the second growth or second cutting of clover. It needs, I admit, some management to get clover ready to cut at the time corn is ready for the silo. These mixtures were put into the silo in the proportions mentioned, and the ensilages were found to be exceedingly satisfactory. They were palatable and relished by the cattle, and there was very very little loss in connection with the ensiling of these mixtures. Their analysis shows that they are very, very much richer than pure corn ensilage. Without troubling you with the chemical data (which are to be found in my report), I should say that by this means it is quite possible to obtain ensilage containing one-half or three-quarters more protein than is found in ensilage made simply from corn. The practical deduction from this is, of course, that with such ensilage the amount of grain used in the ration can be very materially reduced. It has all the qualities which are desirable in an ensilage. It is succulent and digestible and palatable. It will be of service in keeping up the milk flow. At the same time, it furnishes a large proportion of that protein which we usually have to supply in the form of concentrated meal.

By Mr. Erb :

Q. Do you think that corn cut and put in the silo at the same time with clover will be ahead of cured clover mixed with the ensilage ?

A. I do. That is to say, that the preservation of food in a succulent and more or less natural form has greater feeding value, especially for dairy purposes, than the same food constituents in a dry, cured form. There is certainly a loss in food value in the silo, fermentation takes places in the silo, no matter what you put in—corn or clover, or both together—and fermentation means loss. But nevertheless, the percent-

age of loss is not so great but that there is economy in the preservation of food in that way. There are difficulties in ensiling materials which are rich in nitrogen, and that is the reason why farmers so often fail to make good clover ensilage ; there is a loss of 10 to 20 per cent, possibly more, in many instances, but the presence of corn with the clover minimizes and reduces that loss. I think it would be a distinct advantage to have the clover ensiled with corn, rather than cured and mixed with corn ensilage—provided the mixed ensilage is of good quality. Of course, the cattle will need a certain amount of hay daily, in addition to this ensilage, and some meal.

By Mr. LeBlanc :

Q. The corn and clover are grown in different fields, in separate fields ?
A. Oh yes, they are grown separately.

VALUE OF ROOTS IN THE FEEDING OF FARM STOCK.

Speaking in regard to roots, if you will refer to our report for several years past, you will notice we have been ascertaining the relative feeding value of ordinary farm roots, more particularly mangels, turnips and carrots. Sugar beets, also, to a certain extent have for some time past been examined from this point of view. We have found that there may be, from year to year, a variation in their nutritive qualities. I think most of us are accustomed to think of a mangel as a mangel, and of a carrot as a carrot only, without recognizing that there may be a variation in their qualities from year to year. Our experience shows that roots may vary greatly according to the character of the season ; for instance, we found, last year, that there was a great improvement in the quality of roots over those of the year previous. This may be in part due to the character of the seed, because there is no doubt that the breeding of roots to a high percentage of dry matter, sugar and protein is quite possible and no doubt, is being prosecuted by skilful seed-growers. It may be also due in part to the character of the soil ; the richer the soil, in some respects, the better the roots, though an excess of soil nitrogen tends to a reduced sugar-content. The improvement we noticed last year, compared with the year before, is in increased percentages of dry matter and of sugar. According to our laboratory data, the roots of 1902 should have a feeding value almost 50 per cent higher than those of 1901. That improvement is, I think, due largely to the favourable character of the weather in the autumn. I think that a dry, warm September, for instance, is conducive to a high sugar content, and sugar is undoubtedly the chief element of feeding value in these roots. We had such an autumn last year. Mangels contain usually in the neighbourhood of 10 per cent of dry matter, and last year we obtained between 12·77 per cent and 13·90 per cent dry matter. Again, by reference to the data you will notice that the 'Gate Post' mangel contained over 9 per cent sugar last year, while the season before it contained 4 per cent. This is only one instance ; all the roots showed higher percentages. We shall continue these investigations, because it is desirable to find out, if we can, the factors that control the composition of roots.

SUGAR MANGELS.

I wish further to call your special attention to certain so-called sugar mangels which have been reported on by us for years past, the Giant Sugar Feeding, the Half Rosy, and the Half White Sugar Feeding Mangel. Some of these have originated in France, by Vilmorin et Cie, a company who have made a specialty of breeding sugar beets. In this they have been very successful. Thus, properly grown and under favourable conditions of climate and soil, the 'Vilmorin Improved' sugar beet will contain over 50 per cent sugar. And these results have been obtained by careful breeding and selection. We found that these so-called sugar mangels contain very much more dry

matter, sugar, than the ordinary field mangels. Thus, the 'Long Red,' 'Gate Post' and other field varieties may contain from 10 to 12 per cent of dry matter, and say, 4 per cent to 6 per cent of sugar, whereas these specially grown sugar mangels will contain from 13 to 15 per cent of dry matter, and a large portion of it, at any rate from 8 to 10 per cent, is sugar. It is evident, therefore, that these 'sugar' mangels have a very much higher feeding value than the ordinary field varieties. You may ask me how they compare with ordinary mangels in yield. I have taken the following figures from Mr. Grisdale's 1902 report in regard to the field yield, so that you may have some idea as to how they stand in that respect. The 'Long Red' mangels—leaving out the number of pounds—last year produced 23 tons ; the 'Golden Tankard,' 26 tons ; the 'Giant Yellow Globe,' 28 tons.

With regard to these special sugar mangels to which I am referring, we had, last season, 21½ tons per acre ; so that the yield was not with us quite equal to that of the ordinary field variety, but nevertheless, the increased sugar content makes them much more valuable, weight for weight. It seems to me that we have in them a very valuable fodder plant, and I think that our farmers should make some trial with them. Possibly, the field yield will, with continued culture, exceed the tonnage I have given you to-day.

VARIETIES OF SUGAR BEETS.

Passing on to the question of sugar beets proper, as grown for beet-sugar manufacture, I might say that we have obtained further data as to the suitability of climate and soil in various parts of the Dominion for sugar-beet culture. We have submitted to analysis sugar beets grown in, I think, every province of the Dominion. The analyses are recorded in full in my report for last year, and consequently it will be unnecessary for me, on this occasion, to go into details.

The question of the profitable growth of the sugar beet for manufacturing purposes is one which has awakened very much interest in recent years, especially in Ontario, where, as you may know, they have established no less than four beet-sugar factories during the past two years. This is not a new matter with us : we have analyzed beets and examined into the suitability of Canada for the growth of the sugar beet, I may say, ever since the institution of the experimental farms, and our results are to be found in the annual reports and in my 'evidence' before this Committee. However, we have found, this past season, that there are certain varieties which seem especially suitable for sugar-beet factory work, namely : Vilmorin's Improved, Klein Wanzleben and Très Riche. These are the varieties which, I believe, now are generally recognized as the best to grow for factory purposes. In addition to these, a large number of other varieties have been examined, and, speaking generally, I may say that in the majority of instances the results are very satisfactory, indeed I think somewhat more satisfactory than those of previous years. I attribute the high sugar content which we found last year to the fact that there was, in many parts of Canada, during the autumn, the climatic conditions favourable to sugar development. No doubt, some of the improvement was due to better culture. The sugar beet for factory purposes requires special culture, and our people are better informed on the subject than they were ten or twelve years ago. In the following table I present certain of the more important data :—

*SUMMARY of Sugar-beet Analyses, 1902.

Province and Locality.	Variety.	Sugar in Price.	Solids in Price.	Coefficient of Purity.	Average Weight of one Root.	
		Per cent.	Per cent.	Per cent.	Lbs.	Ozs.
Prince Co., P.E.I.	Vilmorin's Improved	16·91	20·54	82·31	1	9
Nappan, N.S.	"	14·57	18·06	80·67	..	14
"	Très Riche	16·95	20·77	81·12	1	0
"	Klein Wanzleben	16·08	18·68	86·08	1	0
Ottawa, Ont.	Vilmorin's Improved	17·26	19·32	87·00	1	1
"	Très Riche	15·81	17·65	89·50	1	1
"	Klein Wanzleben	17·84	19·49	91·51	1	3
Manitoba.	Vilmorin's Improved	13·88	20·73	66·95	1	12
"	Très Riche	20·17	23·05	87·50	..	15
"	Klein Wanzleben	16·91	21·12	80·10	1	2
Indian Head, N.W.T.	Vilmorin's Improved	14·12	17·8	79·32	..	15
"	Très Riche	16·52	19·8	83·43	1	0
"	Klein Wanzleben	14·80	18·6	79·69	..	15
Strathcona, Alta., N.W.T.	"	15·22	19·2	79·12	1	10

* In this table the results obtained from three varieties only, Vilmorin's Improved, Très Riche, and Klein Wanzleben, are included. The data in full are published in the Report of the Experimental Farms, 1902.

MOISTURE CONTENTS IN CREAMERY BUTTER.

You have, no doubt, seen in the papers recently certain references to the composition of our Canadian creamery butter, and more particularly with regard to its moisture content. Owing to the presence on the British market of certain butters which were considered to contain an excessive amount of moisture, a commission was appointed by the Board of Agriculture of the English House of Commons to examine into the whole matter and to report as to what would be considered by experts a legitimate amount of moisture to be present in pure and genuine butter. That committee brought in a voluminous report, which was of a very comprehensive character. Every phase of the question was considered, and, as a result of the presentation of that report to both English Houses, a law was passed to the effect that butter to be accounted genuine must not contain more than 16 per cent of water. News of this course came over to Canada, and there was naturally a desire on the part of our creamery men, our manufacturers and our exporters to know how our creamery butter stood in this respect. I do not wish you to infer that there was any doubt thrown at any time upon the genuineness of Canadian butter in the English market, but we wished to be assured ourselves that it was well within the prescribed limit. We hoped, and what is more, we expected that our butter would be found perfectly satisfactory, but we needed the data, both for our own information and those to whom we sell butter in England. It would be necessary to have data—chemical data—if any case should arise or our butter was criticised. Then, we felt that if our data were satisfactory, they would help us from the point of view of advertising our butter in the Old Country. We accordingly, at the instance of the Dairy Department of Agriculture, submitted to analysis a number of samples. There were in all 105 samples. Of these 75 were collected at creameries representing most of the provinces of the Dominion, and 30 were taken from export packages ready for shipment in Montreal. The results of that examination have been published in brief in a special bulletin, Bulletin No. 4 (New Dairy Series), under the Commissioner's Branch of the Department of Agriculture. Very briefly I may say this, that the average percentage of water from these 105 samples was found to be 12·31. The percentage of moisture on the samples taken at the creameries was 12·16, and the

average of the 30 samples from the warehouses, 12·69. That gives us a grand average of 12·31. This investigation, therefore, shows that not only are we very well within the limits of the English law, but that, in comparing our figures with those of the analyses of many European butters, we find that our Canadian creamery butter is very much drier, and, consequently, is better value than much of this butter which is made in Europe, and which finds its way to the English market.

I may say that, following up that work, we are at the present time engaged in a very careful investigation, with the object of ascertaining the factors or conditions which affect or in any way control the moisture content of butter. In this work I am associated with Mr. Ruddick, of the Dairy Division of the Department of Agriculture. We are at the present moment conducting a number of trials, making butter under known conditions, but varying the conditions from time to time, according to the experiment in hand. A scheme or plan has been drawn up for this work, and is being closely followed. These butters are being examined and analyzed in the most thorough manner possible, in order to learn what the factors or conditions are which affect to any extent the composition and the quality of butter. We expect to obtain from this, information that will prove useful to those who are making the butter in the creameries, information as to the correct temperatures of churning and washing, the extent to which cream should be ripened, the amount of salt to be used, the length of time of working after salting, &c., &c. All these points are being examined carefully into, in order to ascertain how far these factors may affect, first, the moisture content of butter, and then how far they may affect the composition of butter. Samples of these butters have been put aside so that their keeping qualities may be ascertained at a later date. This will not only be a very interesting investigation, but one furnishing information which, we expect, will be very useful, not only to our own butter makers, but possibly to others.

By Mr. Erb :

Q. You gave us the average content of water in the samples. Did you find much variation in them ? Have you the figures showing the highest percentages of moisture contained ?

A. These figures are given in the bulletin to which I have referred. I can give to the Committee a short table which will make the point clear.

Q. Give us the lowest and the highest ?

A. The lowest was between 7 and 8 per cent, the highest between 16 and 17 per cent. I will read the list, and I think you will get a better idea of the general character of the butters in this respect. We found :

		Water.				
1	sample	between	7	and	8	per cent.
1	"	"	8	"	9	"
4	samples	"	9	"	10	"
15	"	"	10	"	11	"
24	"	"	11	"	12	"
23	"	"	12	"	13	"
24	"	"	13	"	14	"
10	"	"	14	"	15	"
2	"	"	15	"	16	"
1	sample	"	16	"	17	"
105						

Thus, you see, the majority of them are between 11 and 14 per cent.

By Mr. Robinson (Elgin) :

Q. That is Canadian butter ?

A. These are all Canadian butters.

By Mr. Smith (Wentworth) :

Q. What do you say was the limit the English law allowed ?

A. It is 16 per cent. We only found one sample above that figure, and, upon looking up the data supplied with the sample, with regard to churning temperature, and so on, we found this butter was churned at a temperature above 60° Fahr., and the washing was done at 64° Fahr. These are unusually high temperatures in Canadian practice. So we may say that this really was an exceptional butter.

Q. Was it a creamery sample ?

A. It was a creamery sample. We had no data of the character I have referred to in regard to the manufacture of the samples collected in Montreal. Full particulars of manufacture accompanied the samples of butter sent from the creameries.

EXPERIMENT WITH FATTENING CHICKENS.

Before closing this evidence, I wish to bring before you very briefly certain results we have obtained in the fattening of poultry. It may seem a little strange to you that I should present this subject, since the managing of poultry is not in my division, but it is a matter easily explained. The question of poultry feeding, or rather the fattening of chickens, is one which has awakened considerable interest in many parts of our Dominion during the past two or three years, in connection with the possibility of building up a large export trade in fattened chickens to the English market. On looking over published records on this subject, I found that very little of an exact character is known with regard to the proper foods, the amount of food and methods of feeding best suited for fattening chickens. At all events, we had not any information of this character from a Canadian source. We, therefore, thought it would be desirable to undertake a series of carefully conducted feeding experiments, as preliminary to an investigation regarding the digestibility of the various foods and rations. We thought it desirable that we should obtain data as to the practical value of certain foods which were as far as possible of a strictly accurate character, in order to form a basis for further and more scientific work. So far, practically nothing is known as to the digestibility of foods by poultry. In cattle feeding, the digestibility of various foods is considered a matter of great importance towards economical and profitable feeding. It is not, of course, possible for the farmer to conduct digestive experiments with cattle, neither is it possible for the poultry man to obtain information of this character with poultry. It is important to know the percentage of food digested by the fowl, because it is not the quantity eaten, but the quantity digested and assimilated, which gives the increase in live weight. It, therefore, becomes the duty of the chemist to ascertain the digestibility of foods in connection with poultry feeding, as with ordinary farm stock. We accordingly instituted the experiments the results of which I propose briefly to place before you. This investigation is still in progress. During the past winter we made a beginning with our digestion experiments, but they are not yet completed. We shall continue this work, possibly for several years, for it should give important information. Incidentally, we have obtained some very valuable data in connection with the practical fattening of chickens for the market, and since these results were obtained by the chemical staff, and we are perfectly familiar with the various results obtained from the different rations, it was thought desirable that we should present them.

BREED OF FOWL AND RATIONS.

One of our first experiments was to ascertain if there were any special breeds better adapted to fattening than others. The birds which were used in this experiment were, at the time we commenced feeding, some two months old, and the feeding trial lasted for six weeks. They were fed in small pens, 8 feet by 14 feet, with yards attached, running back about 48 feet. Those of you who are familiar with our poultry accom-

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modation at the farm will remember the long yards, divided by netting, at the rear and side of the poultry-house. The grain ration which we used on that occasion consisted of four parts ground oats, three parts of barley meal and one part of meat meal made into a mash with skim milk. I must not take the time, this morning, to discuss at any length this question of foods as relating particularly to poultry feeding, but I would point out that we do not look upon the fowl as altogether herbivorous. There is no doubt the fowl is omnivorous. Part of its food is naturally insectivorous. In these pens, of course, the fowls cannot get insects, and if we wish to follow nature in this matter, we should supply the fowl with some proportion of food of this character. This we did in the highly concentrated form of meat meal. We know, in feeding cattle, we require nitrogenous compounds in the ration in the proportion of one part to five, or one to six of fat and carbohydrates, that is to say, one part protein or flesh-formers to five or six parts of starch and fat—heat and energy producers. In poultry feeding we find a very much narrower ration is productive of good results. We have had most excellent results from a grain ration containing one part of protein and three to four of fat and carbohydrates. The cost of this feed was 1⅓ cents a pound. The ground materials were mixed with skim milk and fed in the form of a mash. There were twelve breeds under test, and four or five of these gave results almost identical.

By Mr. Erb :

Q. What do you mean by meat meal ?

A. It is a product of the packing houses in which the coarser parts of the meats that cannot be tinned are dried and ground up. This meat meal is very nutritive, as a rule, containing as much sometimes as 60 per cent of protein and 12 to 15 per cent of fat. Meat meals, of course, are extremely variable in composition. The one we used, purchased in London, Ont., contained about 60 per cent protein and almost 20 per cent fat.

Q. It is on the market ?

A. It can be purchased. It is not at all unknown to poultry men. It is not a new thing. Some meat meals contain a fair amount of bone. Care should be exercised in buying, so that a good quality of meal is secured.

By Hon. Mr. Fisher :

Q. About what is the price of it ?

A. Between 2 or 3 cents a pound. We calculate the whole ration as worth 1⅓ cents a pound, including the cost of grinding. In five of the twelve breeds examined we found the results almost identical, the cost of the feed per pound of live weight increase being from 3·8 cents to 4 cents. The five breeds were White Plymouth Rocks, Barred Plymouth Rocks, Faverolles, Silver Grey Dorkings and Orpingtons. The results in detail, will be found as they are in our report for 1902, as an appendix to that of the poultry manager. We invariably found that the cockerels made the most gain. The gain was not always uniform throughout the feeding period. The age is one factor that affects the increase, and we also noticed that the temperature had a marked effect in this connection. Whenever it was very hot, muggy weather, the birds did not fatten as well as during cool weather. The excessive heat affected the general thrift and gain of these fowls, though I do not think it affected their health. As to the general question of breeds it remains for Mr. Gilbert to speak, as that is a matter more in his department than mine. You have heard from him that the question is one quite as much of type or shape as of breed. These results bear out that statement, for Faverolles, Plymouth Rocks, Orpingtons, and Silver Grey Dorkings are breeds of the same general type. No doubt amongst these will be found the best birds to fatten.

RESULTS FROM FEEDING WHOLE AND FINELY GROUND GRAIN, RESPECTIVELY.

Another experiment we undertook was in regard to the comparative value of whole and finely ground grain. In some parts of Canada it is difficult to get grain finely

ground, so it is of importance to learn if finely ground grain is necessary to profitable feeding. This experiment was conducted in duplicate, so that there might be ample data upon which to base conclusions. We used the same ration as in the former case, viz., four parts ground oats, three parts of barley, one part of meat meal, with skim milk. To one lot of chickens the grain was fed whole and for the other it was ground. We used for this experiment Barred Plymouth Rocks, cockerels, about 12 weeks old, and the feeding test, as in the former experiment, lasted six weeks, and was conducted in pens with yards attached. In the case of the six fowls which were fed on whole grain, the gain was 10 pounds and the cost per pound of live weight increase was 7·1 cents, and in the case of the six fowls fed on finely ground grain the gain was 16·8 pounds and the cost per pound increase in live weight was 5·6 cents. Thus there is a difference of 1½ cents in the cost per pound of live weight in favour of the finely ground grain ration. The birds on fine grain ate more by 7½ pounds but their increase in weight was so much greater than those on whole ground that they were fatted at less cost per pound. That was in the first trial. In the second trial we obtained equally satisfactory results, so we may say that it is profitable to have the grain thoroughly ground. It takes energy to grind grain in a mill and it takes energy to grind it in the fowl, it uses up muscular force which calls for a certain expenditure in another of food. Undoubtedly it pays to grind the grain which is being fed to fattening poultry. I may say that at the conclusion of these trials all these fowls were dressed and the various parts weighed. We took careful note of the weight of the carcase, of the giblets, the heart and liver and so on; of the entrails and feathers, and found that there was a difference of 5 per cent in favour of the dressed carcasses of those which had been fed on finely ground grain. Moreover, these presented altogether a finer and plumper appearance.

SKIM MILK AS A RATION FOR FOWLS.

You will doubtless remember that last year I referred to the great value of skim milk as a food for pigs.

By Mr. Boyd :

Q. What season of the year was it you conducted these experiments ?

A. We commenced work on the 6th of June last year and continued the work to the close of the season, through the months of June, July, August and part of September.

It occurred to me that it would be valuable to obtain some data as to the value of skim milk as a food for poultry, and consequently we instituted trials, making a comparison between skim milk and water with the same grain ration. The grain ration was that used in the experiments already referred to. With one lot of chickens it was fed with water and in the other case it was mixed with skim milk, keeping a record of course of the amount of skim milk used. The breeds used for this experiment were Rhode Island Reds, Barred Plymouth Rocks, and Orpingtons, fowls from two to three months old, and the trials, made in duplicate, lasted six weeks each. The cost of feeding, per pound of live weight increase, in the case of the milk-fed fowls was 4·7 cents, and in the case of the chickens on the water-mixed ration the cost was 5 cents per pound of live weight increase, so that in our first trial we had a difference in favour of the milk-fed fowl of ½ cent per pound. In the second trial, in which we had Barred Plymouth Rocks, we found the difference still greater. The cost of the food per pound of live weight increase, in the case of the milk-fed fowls, was 5·7 cents, but when water was used instead of milk the cost was 6·7 cents. There was, therefore, one cent a pound advantage in favour of the milk-fed chickens. I may say also that we found the latter much plumper and juicier. They also showed about 2 per cent more dressed carcase.

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By Mr. Robinson (Elgin) :

Q. Was the price of the milk used taken into consideration ?

A. Yes : we valued the skim milk at 15 cents per 100 pounds. I can give you the weights of milk used.

Q. Did you allow for the difference between the cost of milk and water ?

A. Yes. Taking the first trial, with Rhode Island Red Orpingtons, the total cost of food was 60 cents for the milk-fed chickens, and for chickens in the group fed with water and grain it was 53 cents. The cost of food is smaller, you will observe, where we used water ; but, nevertheless, the cost of food per pound of live weight increase was greater.

Q. That is the point.

A. Then, in the second trial (with B. Plymouth Rocks) the cost of the food in the milk-fed group was 89 cents, whereas that of the water and grain was only 78 cents. Nevertheless, in the milk-fed chickens the cost of food per pound of live weight increase was 1 cent less than with the chickens that did not receive milk, and, as I have said, the milk-fed chickens were decidedly better in appearance. They were plumper and were considered juicier and of finer flavour and gave about 2 per cent more in the dressed carcase.

COMPARATIVE RESULTS FROM PEN, VERSUS, CRATE FEEDING OF CHICKENS.

We made an experiment, in duplicate, to ascertain what difference might result when fattening chickens to allow them a certain amount of exercise, as against feeding them in crates. The crate method has been largely advertised. It is used in the old country and on the continent and is considered by some as absolutely essential to profitable chicken fattening. The importance, therefore, of these experiments is obvious. The first trial was with Silver Gray Dorkings, and the second trial with Barred Plymouth Rocks. Exactly the same ration was used as in the previous experiments : four parts of oats, three parts of barley, one part of meat meal, mixed with skim milk. In each trial half the number of birds (6) were fed in crates, and half in the pens with yards attached. In the case of the Silver Grey Dorkings, we found that those fed in pens cost us for the food per pound of increase in live weight 3·3 cents, whereas those fed in crates cost 4½ cents per pound of increase in live weight. It will be observed, there was a balance of 1⅓ cents in favour of those fed in pens. In the second series, with the Barred Plymouth Rocks, we had results strictly in accord with these. The cost per pound of increase in live weight of the birds fed in pens was 5·7 cents, and of those fed incrates, 6·8 cents. Then, on the dressing of these fowls, as ready for market, we found those from the pens had by far the finer appearance, both as to colour and size. I think, with such marked results from experiments made carefully and in duplicate, I need have no hesitation in saying that the pen fattening is the most profitable.

By Mr. Sherritt :

Q. How large were the crates ?

A. The coops were continuous, but separated by board partitions, making divisions or compartments which were 17 inches long, 11 inches deep and 19 inches high. One bird was fed in each compartment, the front and bottom of which were made with slats. The food was placed in a V-shaped trough outside, attached to the front of the crates.

RATION CONTAINING GLUTEN MEAL.

Certain other rations were experimented with. One, made up with gluten meal, gave very satisfactory results. We found that flesh could be put on at a cost of 4½ cents per pound of increase in live weight. The chickens made very satisfactory pro-

gress, and I think it would be well to continue experiments in chicken fattening with gluten meal. As I have said this morning, we have found it a valuable concentrate for other farm stock, and I think we shall find it valuable also in this class of work, but more experiments must be made before we can speak very definitely.

The ration was : ground oats, 3 parts ; best gluten meal, 1 part ; fed with skim milk.

You will notice this ration does not contain any meat meal, the gluten meal, at a less cost, taking its place.

RATION CONTAINING CLOVER MEAL.

One other ration I will just very briefly call your attention to ; it is one containing clover meal. Clover meal (the dried and ground clover plant) has been spoken of very highly, and very much advertised by certain people as a desirable food for poultry. I cannot speak of its value with regard to laying fowl, but our results do not allow me to speak favourably of it in connection with the fattening of poultry. We tried a ration of ground oats 5 parts, ground clover 5 parts, meat meal ½ of a part, mixed with skim milk, and we found that it cost us nearly 7 cents per pound for the increase in the live weight. The fowls were of the most unsatisfactory appearance when dressed ; they were not by any means a desirable market fowl. This ration seemed to derange the fowls. It is my opinion that we cannot use this bulky, fibrous food to any extent in connection with the fattening of poultry. The previous ration with gluten meal produced flesh 2 cents per pound cheaper than this clover meal ration.

By Mr. Smith (Wentworth) :

Q. I would like to suggest to you the desirability of making some experiments next year in relation to cover crops in vetch and other cover crops, both as to the amount of nitrogen taken from the atmosphere, and the amount of moisture they take from the soil. Take a season like this last year, when it has been very dry, and the farmers shorthanded, sometimes they do not get their cover crop ploughed under as early as they should do, and it is very important they should know how much one crop takes out of the soil, as compared with another. We have no data to go on as to the greatest amount of nitrogen taken from the atmosphere by the various crops, and that is, of course, of extreme importance to the fruit-growers ; we have no experimental farm in our district, and we have to depend upon you, and I am sorry to say we have had to depend upon Cornell for information respecting these cover crops during the last two or three years.

A. Yes. We shall be pleased to extend our work with cover crops, as you suggest. Cornell has used our data in the past in this matter, but we are glad to interchange information. I mentioned yesterday that the horticulturist of the Central Farm has this year instituted certain experiments for the purpose of ascertaining the value of hairy vetch and other cover crops. One plan is to plant them in rows in the orchard, so that the soil may to a certain extent be cultivated. This will conserve the soil moisture. I shall possibly be able to make the experiments you suggest, as regards nitrogen content and moisture conservation, in connection with this investigation.

Having read over the preceding transcript of my evidence, I find it correct.

FRANK T. SHUTT,

Chemist, Dominion Experimental Farms.

BEE KEEPING

HOUSE OF COMMONS,
COMMITTEE ROOM 34,
FRIDAY, June 26, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock a.m., Mr. DOUGLAS, Chairman, presiding.

Mr. John Fixter, Farm Foreman and Apiarist at the Central Experimental Farm, was present, by request of the Committee, and examined on the experiments and investigations in regard to bee-keeping carried on at the farm, and made the following statement:—

Mr. Chairman and Gentlemen, this is the first time I have had the pleasure of coming before you to explain some of the work carried on at the Experimental Farm for a number of years past in the matter of bee-keeping. I might first run over a few of the experiments that we have been carrying on during the past eight years, as the results of these experiments have never appeared in the reports of your Committee. I will give you the headings at the outset, and, if it is the wish of the Committee, give the details afterwards as to the various experiments.

The first series of experiments carried on was conducted to test the value of different kinds of hives, the second was made with different kinds of section foundation, the third with section foundations of different sizes, and the fourth with brood foundation of different sizes, against whole drawn comb. We have kept at the same time a list of the trees and plants that the bees made the most honey from, the trees, plants and shrubs on which the bees were seen working during the summer; we have sowed buckwheat at different dates to find out which date is the best for making the most honey, while producing the largest crop of grain for the farmer. Records have been kept to find out how much honey was made daily by single colonies. Then, we have tested the keeping qualities of ripe and unripe honey; we have made experiments to ascertain whether the bees can injure sound fruit; also, the possibilities of success with a house apiary. This was an experiment made for the benefit of those who live in cities and towns and have not very much room. We have tried feeding sugar syrup for winter stores, also wintering bees in different places, and experimented with reference to the bee moth.

TEST TRIALS OF VARIOUS KINDS OF HIVES.

The experiments with four different kinds of hives were commenced last year. We used four different kinds of hives, two of each kind, prepared, one for the production of comb honey, and the other for that of extracted honey. You will notice on the charts the hive that is known as the 'Langstroth,' and this was tested against three others—the 'Hedden' hive, a very much smaller one (15 x 15 x 12 inches) and a very large one (15 x 20 x 15 inches). We found that for the farmer the nine or ten-frame Langstroth hive is the best, while for the experienced bee-keeper I would say that the eight-frame Langstroth hive is much better, because the experienced bee-keeper will look after his bees better than the farmer usually does, and will see they have plenty of

stores in the bottom section to carry the bees over the winter. I would say that the ordinary farmer should have a little larger hive than the experienced bee-keepers, so that his bees will be able to look after themselves. Two hives of each of the above-mentioned sorts were used, as I said before, one being arranged for section honey, the other for extracted honey. Eight colonies of bees were selected for this experiment, all of about the same strength and having good laying queens. The results from the four kinds of hives are shown in the following table. The hives are tabulated in the order of the returns they gave, as follows :—

Hive.	Season.	Swarms.	Section Honey.	Extracted Honey
			Sections.	Lbs.
Langstroth frames, 18¼ x 12½ x 9½ in. deep	1901.	1	67	0
" "	1902.	1	0	79
" "	1901.	1	42	0
" "	1902.	1	0	48
" 15 x 15 x 12 inches	1901.	1	56	0
" "	1902.	1	0	63
" "	1901.	1	36	0
" "	1902.	1	0	42
Hedden frames	1901.	0	54	0
"	1902.	0	0	62
"	1901.	1	38	0
"	1902.	1	0	43½
" 15 x 20 x 15 inches	1901.	0	0	0
" "	1902.	0	0	23
" "	1901.	1	*16	..
" "	1902.	1		46½

* The 16 sections were only partly filled.

TESTS OF DIFFERENT COMB FOUNDATIONS.

The next experiment that was carried on was with different branches of comb foundation. We wanted to find out which kind of foundation the bees would draw out the easiest and would utilize the most of. It was proposed that those brands of wax of which the bees used the most, or, in other words, to which they added the least amount of wax in the building of cell walls, would prove to have the greater value to the bee-keeper. Most practical bee-keepers argue that, by supplying the bees with wax that they can readily draw out and utilize in cell formation, a greater store of honey may be obtained. We found that it was not good to give too heavy a wax nor too light a wax, because, in the process of manufacturing, the very light wax has to be melted at so high a temperature and is pressed so firmly that the bees could not draw it out, but that it was much better to use a medium wax of good quality, melted at a temperature of about 89°. I would, therefore, say, use a soft, pliable wax in preference to a very, very hard one. The wax of each section had been carefully weighed before being put in the section, and was again carefully weighed at the end of the season, after extraction of the honey. This work was done by the chemist, Mr. Shutt, on the fine chemical scales, at the chemical laboratory on the Central Experimental Farm, so that we were able to ascertain exactly how much wax of the foundation the bees had utilized, and how much they had added. The results of these experiments are printed in the reports of the experimental farms which I have with me here ; and, if it is the wish of the Committee, I could give them to you, but it would take much time.

The next experiment we carried on was with foundations of different sizes. Many people advise putting in a very small piece of foundation in each section. The conse-

quence is, we get many letters from people who are keeping bees, asking why it is their bees do not go up into the top sections to work. On making inquiries, we find that they had only put a very small portion of wax foundation in each section, and the bees, of course, did not care to go up there and work, especially if they had full foundation sheets. Therefore, to persons making up sections I would say : Put in full sheets of foundation every time; you will thus get better results; the sections will be filled up more evenly, and the bees will go up into them very much more readily than if you put only a small piece of foundation in the sections. Many persons have an objection to eating comb honey, because there is such a large portion of foundation in the centre in which the wax is sometimes so thick between the rows of cells that, on account of its appearance and hardness, it has been called 'fish-bone.' That is one reason why we wanted to get soft wax, so that people eating the comb would not feel it unpleasantly when they were biting through it. I will now show you how sections are filled with foundation sheets, as represented on the chart. I place a sheet of wax of the full size of the frame, after raising the movable portion of the upper slat, which I then close down upon the sheet, so as to keep it firmly in its place, I trim it off along the top with a knife, and it is in its place.

This split-top section, that is with the top slat split along the centre, is a new section only lately introduced, and is an improvement on the old kind with this slit, makes it very much handier for the inexperienced bee-keeper. We tried empty sections, and we found that the bees would not go into them at all to work ; they must have something to encourage them to go up into the super or top part of the hive to store their honey.

EXPERIMENTS WITH BROOD FOUNDATION.

The next experiment was with different size of brood foundation, which you will notice is a very much heavier foundation than the section foundation. It is made heavier so as to be able to bear the weight of the swarms. This kind of foundation is shown on the centre of the chart. We experimented at the same time with full drawn combs, the same as in this frame in my hand, in which the cells are drawn but have been emptied. Some of the frames had thus full sheets of foundation, some half sheets of foundation, and some only starters or strips of about one inch, attached at the top. Some, thinking it might be more economical, put only a little strip of foundation in the centre of the frame, for the bees to start from and make a comb. The second section of the chart shows a frame as taken from the hive and in which only a strip of foundation had been placed. You can see the irregularity with which that comb has been built.

The result of these two last experiments show that it is better in all cases to use full sheets of foundation both in the sections of the supers and in the frames of the brood chamber. I would advise especially the farmer, or whoever does not make a regular business of bee keeping, to put in full sheets; and, if the bees swarm, try if possible to have full drawn comb to put the swarms on. If a man puts a large swarm weighing five to ten pounds on a small foundation on a warm day, the weight of the bees is liable to break it down. It has been very strongly recommended by the best bee-keepers in Ontario to wire the frames up and down rather than horizontally as usually practised. They claim that thus the wires hold the foundation very much better; I have not tried this plan myself but hope to try it this year. Sometimes experienced bee keepers will tell you to hive your swarms on starters. That may be all right for them, as their object in hiving swarms on starters is this, that so the bees will employ their time in storing honey in the supers instead of having to attend to the brood, as the queen bee will have less room to lay her eggs. But, it is not only honey we are after; we must get the swarms to start well, and when they have made a good start then the honey will come afterwards, and they will have sufficient stores for the winter. So that again I say for those who do not make a business of bee keeping: Put in full foundation sheets or full drawn combs, which is much better. After they have greater experience, they

can hive their swarms on starters, and, if the swarms get too much drone comb, they can cut it out, and replace it with full sheet foundations.

LIST OF PLANTS, TREES AND SHRUBS ON WHICH BEES WORK.

The list of plants, trees and shrubs on which the bees were seen working well during the summer, and the dates at which the visits were first noticed, has been very carefully prepared. It shows the trees, shrubs and plants on which the bees were working from April all through May, June, July and August, and up till September and October, covering the whole season. Among the trees that we found to produce the most honey are the basswood, the buckthorn, the Siberian pea-tree. Bees also sip the sap out of the maple wherever injured in the springtime, and from the willow they get the pollen. They also of course work on the fruit bloom; there is a great deal of honey gathered from the raspberry, the apple and cherry blossom as well as from the strawberry.

The following is a list of plants, trees and shrubs on which the bees were seen working well during the summer, with the dates at which the visits were noticed :—

April 18—Snowdrops and squills.
" 20—Manitoba maple and soft maple.
" 21—Willows in swamps and on lawns.
May 10—Tulips.
" 11—Plum and apple trees.
" 12—Dandelions.
" 19—Wild black cherry tree.
" 22—Grape hyacinth.
" 22—Garland Flower (*Daphne Cneorum*).
" 23—Vinca, several varieties.
" 23—Anemones and Alpine poppies.
" 23—*Adonis vernalis.*
" 23—*Doronicum Caucasicum.*
" 24—Sand cherry.
" 24—Currant bushes.
" 24—Siberian pea-tree (*Caragana*).
" 25—Pear and cherry trees.
" 25—Lilacs, several sorts.
" 25—June berry.
" 25—*Polemoniums.*
" 27—Pæonies and Irises.
" 29—Honeysuckles and barberries.
" 31—*Pyrus baccata.*
" 31—Mountain ash.
June 1—Strawberries.
" 2—Buckthorn bushes and hedges.
" 4—Forget-me-not.
" 4—Ginnalian maple.
" 4—Rhubarb.
" 4—Mountain Centaury.
" 4—*Ajuga Genevensis.*
" 4—*Anemone narcissiflora.*
" 7—White Dutch clover.
" 8—Alsike and sainfoin.
" 8—Raspberries and blackberries.
" 8—Sharp-leaved common Cotoneaster.
" 8—Aliums.
" 8—*Rosa rugosa.*

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June 8—Spiræa Van Houttei.
" 12—Golden-leaved Spiræa.
" 12—Highbush Cranberry (*Viburnum Opulus*)
" 14—Geraniums.
" 14—Wild Vetch.
" 19—Large red poppy.
" 19—Strawberry-flowered Cinquefoil
" 19—*Lupinus.*
" 21—Golden Groundsel.
" 21—Wild Mustard.
" 21—*Dictamnus.*
" 23—Locust.
" 23—*Rosa multiflora Japonica.*
" 24—English horse beans.
" 28—Broad-leaved Bellflower.
" 28—*Anchusa altissima.*
July 1—Sweet clover (*Melilotus albus*).
" 8—Asparagus.
" 8—Grass peas.
" 8—*Lathyrus sylvestris Wegneri.*
" 8—*Eremurus altaicus.*
" 8—*Sedum Kamtschaticum.*
" 8—*Thalictrum aquilegifolium.*
" 11—Basswood.
" 14—Lilies, different varieties.
" 14—Veronica, different varieties.
" 14—Mulleins.
" 15—Double Queen of the Meadow.
" 15—*Linaria.*
" 15—*Asclepias tuberosa.*
" 15—*Agrimonia.*
" 18—Mignonette.
" 23—*Hypericum Kalmianum.*
" 27—*Echinops Ruthenica.*
" 28—*Lychnis.*
" 30—*Solidago.*
Aug. 9—Button Buch (*Cephalanthus occidentalis*).
" 9—Pumpkin.
" 9—Late-sown English horse beans.
" 11—Campanulas and Rudbeckias.
" 21—Sunflowers.
Sept. 1—Wild Asters.
Oct. 4—African Marigold.
" 4—Gaillardias.

CLOVERS FOR HONEY, FODDER AND FERTILIZER.

There has been very much experimental work done in the way of showing the farmer the best clovers to sow. We are working, however, to find out which has been the best clover to produce honey. But the difficulty is, we cannot expect farmers to grow clover merely with the object of making honey ; we must be able to show them what kind of clover to sow in order that, in addition to furnishing honey, it will furnish fodder and be equal, if not better, as a fertilizer than any of the clovers now in general use.

By very careful observation, the clover which I have found to produce the most honey is what is known as sainfoin. It has been generally thought that the little white clover or alsike produced most honey, but I have found that the sainfoin clover will give, I am safe in saying, a greater amount of honey than the white clover will, and it gives also a good amount of fodder per acre. This plant, of which I have brought specimens to show you, you will see is a vigorous grower and does not become too woody to be used as fodder. These specimens are about five years old. When we can get the farmers to grow sainfoin for fodder, bee-keeping will have a boom, and will be far more successful. You will notice that this plant has a very deep root and has a great number of nodules on the roots. The next best clover, as a honey plant, is what many call a weed, Bokhara clover. Many people say that this grows wild, and that they cannot get rid of it. They could, however, if they tried. If it is cut down after it flowers, it can be destroyed ; but if you allow it to seed and the seed falls into the ground, it will grow up the next year. As to its value for fodder, I cannot say. When cut, it has a strong, pleasant odour, which makes it be called also sweet clover. From its considerable root growth, I should think it would be an excellent fertilizer, when ploughed under.

By Mr. LaRivière :

Q. If cows eat it, will it affect the flavour of the milk ?

A. I am afraid it would.

Q. It is considered nothing but a weed with us, and a bad thing for dairy cattle to eat.

A. We have no experience with cattle eating it. I should think it would be good for sheep or young stock, and make excellent pasture for pigs on account of its rapid growth. If you had a whole field of it and kept the animals altogether in it, I have no doubt the results would be quite satisfactory. I was at a bee-keepers' convention in Chicago, in which this clover was highly spoken of as a fodder plant. I think it would make an excellent pig pasture, it grows so rapidly. Next, these two clovers are supposed by most bee-keepers to be the best for honey purposes—the common White Clover that grows on our lawns and Alsike. This one is what is known as Alfalfa or Lucerne. We have not found our bees to work as well on this as on the others, but it is very valuable as fodder and as fertilizer. I would like to see very many more experiments carried on with clovers, as fodder, as fertilizers, and as bee plants. As I am so much interested in the agricultural part of the farm, attending to the bee-keeping does not take up much of my time ; but I would like to be enabled to do this work, for I think there is no question so important to the farmers as that of fertilizing the soil by turning under clover, at the same time producing a large yield of fodder and rich pasture for bees.

By Mr. Robinson (Elgin) :

Q. Do you use red clover for bees ?

A. We have never known them but once to work on red clover. That was last year.

Q. Did you notice the amount of honey that was produced from it ?

A. The bees did not get as much off the red clover as off the white. There was a great agitation a few years ago to introduce long-tongued bees to work on Mammoth Red clover.

BUCKWHEAT AS A HONEY YIELDER.

We have conducted some experiments with buckwheat for this purpose. Four plots of buckwheat were sown on the farm last season, primarily as pasture for the bees, but also for the grain. The plots were sown on sandy loam, where there had been plantation of forest trees and shrubs for five years previously. No manure of any sort was used. Lot No. 1 was sown on June 16 ; it came up on June 23, and came into bloom on July 18. The bees began to work on this plot as soon as the blossoms appeared,

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which was rather early, as the bees were still gathering clover honey. If the buckwheat had been sown a week later, the bees, this year, would have had more white honey. The seed was ripe on August 29, and the yield was 27 bushels 16 pounds to the acre, notwithstanding that the blossoms were somewhat injured by the excessive heat about the middle of August.

Lot No. 2 was sown on June 29, came up on July 5, and was in bloom on July 31, when the bees began at once to work on it. It was ploughed under for green manure on September 11, when the seeds were beginning to form. Lot No. 3 was sown on July 6 on soil that was part sandy, part clay. That sown on the clay did not do well, as the soil being too dry, the seed did not germinate readily. It came up on the sandy portion on July 13, and was in bloom on August 12. The bees began to work on it at once. It was frozen down by the sharp frost of September 14, when the seeds were ripening nicely. The yield was 21 bushels 37 pounds to the acre. Lot No 4 was sown July 16, came up July 21, was in bloom on August 20, and the bees were busy on the plot until the frost of September 14. There was no ripe grain; so it was ploughed down for manure on September 15.

We found that about July 1 was the best time to sow buckwheat. About the time the buckwheat is in bloom the common white clover has about done blooming and does not interfere when the buckwheat honey is being gathered. I would not recommend sowing earlier, as the white clover and basswood are then past their bloom. We can take all the white honey off and extract the buckwheat honey by itself.

TAKING HONEY FROM OFF THE HIVES,—TIME AND METHOD.

Now, about taking honey off the hives, I wish to give you the results of some experiments conducted by Mr. Shutt and myself in taking honey off at different times and in different ways. I have brought here this morning samples to show you in these bottles. The honey in one of these bottles was from frames in which the cells had not been capped at all, that is, the bees had not finished their work; such honey which has not been capped, is what we call 'unripe honey.' Then, in another bottle we have honey from half-capped cells and in a third bottle wholly capped or what we call 'ripe honey.' This is a very important question, that of having our honey ripe, just as much as it is an important question with fruit growers having their fruit ripe. If you take your honey off before it is capped, it will ferment. That is one of the difficulties which large buyers have to contend with. Many barrels of unripe honey have been known to ferment and made the bung fly out: thus entailing considerable loss. If bee keepers were to take the honey off in good condition, it would pay them much better; that is if they would wait till it is capped. The quality of the honey would be far superior, and the result would be an increased demand. If you are a judge of honey you will notice by sight and taste whether it is ripe or unripe. In these bottles you will see the unripe honey of last season is already in a granulated form; it does not set as does this other, which is ripe honey. This experiment with ripe and unripe honey has been reported upon very fully by Mr. Shutt, our chemist, and with your permission I will insert his report in my evidence. He says:—

'At the request of the Bee Keepers' Association of Ontario we undertook in 1901 to ascertain what differences in composition might exist between honey taken from uncapped and capped comb respectively. Honey from the former is known to bee keepers as immature or unripe, and is generally held to have poor keeping qualities, and, therefore its sale either by itself or mixed with ripe honey is a detriment to the honey trade.

PERCENTAGE OF WATER IN HONEY,—TESTS IN 1901 AND 1902.

In the endeavour to determine the percentage of moisture in the honey we encountered at the outset certain difficulties, and quickly reached the conclusion that the

method employed in obtaining the results on Canadian honeys already on record (Bulletin No. 47, Inland Revenue Department) was unreliable. This method involved the drying of honey solution on asbestos in a steam oven at 96 degrees C. to 98 degrees C. Under these conditions there is a continuous decomposition of the levulose, resulting in an apparent loss of moisture far in excess of the real percentage present. Further experiments were then made, employing lower temperatures, drying in a partial vacuum, &c., and an account of results obtained presented to the Bee Keepers' Association at their Convention in Woodstock, Ont., in December, 1901, and have since been published in the proceedings of that association. Our conclusion then were of a tentative character, but the data certainly indicated that the uncapped or immature honey contained more water—probably between three and five per cent—than fully capped or ripe honey, and further, that the immature honey has a tendency to ferment and spoil.

In the early months of the present year the analytical methods were more critically examined by Mr. A. T. Charron and the Chief Chemist, and a large amount of work done on various honeys and mixtures of dextrose and levulose in order to learn the most reliable way to estimate the water-content of such substances. This investigation was successful, but as the results are of a purely chemical nature and have appeared in the transactions of the Royal Society (1902), it will not be necessary to here reproduce them.

Our revised data on the 1901 samples are given briefly in the following table, which will scarcely require any words of explanation:—

TABLE I.—WATER IN HONEY, 1901.

Comb.	Where kept.	Bottle closed with	Date of Extraction.	Date of Analysis.	Water per cent.
Fully capped	Honey room	Glass stopper	Aug. 6	Oct. 1	15·46
"	Cellar	"	" 6	" 1	15·89
"	Honey room	Cheese cloth	" 6	" 1	16·95
"	Cellar	"	" 6	" 1	15·84
Partially capped	Honey room	Glass stopper	July 1	" 1	19·12
"	Cellar	"	" 1	" 1	26·68
"	Honey room	Cheese cloth	" 1	" 1	20·63
"	Cellar	"	" 1	" 1	21·03
Uncapped	Honey room	Glass stopper	" 1	" 1	19·57
"	Cellar	"	" 1	" 1	19·24
"	Honey room	Cheese cloth	" 1	" 1	18·25
"	Cellar	"	" 1	" 1	22·09

It will be seen that in addition to the main object of the inquiry, we endeavoured to ascertain what effect upon extracted honey might result (*a*) from keeping it in a closed vessel (as in glass-stopperd bottles), and (*b*) open to the air (as in a vessel covered with cheese cloth).

Further, half of the samples were stored in the honey-room, in a small outbuilding, and half in a cellar, which was, however, dry and well ventilated.

The honey from the fully-capped comb contained from 4 per cent to 5 per cent less water than that from the partially or entirely uncapped comb.

The difference in moisture-content between the honeys kept in glass-stoppered bottles and cheese both covered bottles are so small that we hesitate to draw any comparisons as to the respective merits of these methods of preservation.

The honey from uncapped and partially capped comb was found to have decidedly poor keeping qualities, compared with fully-capped comb. Several of the jars of immature honey had fermented, when examined, in October.

This work was recently repeated on honey of the 1902 crop, with the following results :—

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TABLE II.—WATER IN HONEY, 1902.

Comb.	Where kept.	Bottle closed with	Date of Extraction.	Date of Analysis.	Water per cent.
All capped	Laboratory	Glass stopper	Aug. 7	Nov. 6	15·78
"	Apiary	"	" 7	" 11	15·88
"	Laboratory	Cheese cloth	" 7	" 6	17·35
"	Apiary	"	" 7	" 11	16·25
Partially capped	Laboratory	Glass stopper	July 7	" 6	16·58
"	Apiary	"	" 7	" 11	15·33
"	Laboratory	Cheese cloth	" 7	" 6	15·31
"	Apiary	"	" 7	" 11	15·90
Uncapped	Laboratory	Glass stopper	" 7	" 6	17·13
"	Apiary	"	" 7	" 11	16·33
"	Laboratory	Cheese cloth	" 7	" 6	17·56
"	Apiary	"	" 7	" 11	16·18

We notice in the first place that compared with last year's results, the same differences in water-content between the ripe and unripe honeys are not observable, though, as in 1901, the latter contain somewhat the higher percentages. Evidently, the character of the season has an influence in this matter, and it is quite possible that some seasons the honey from uncapped comb may be practically of equal quality to that from capped comb.

In the case of honey extracted from fully-capped comb, it would appear that it absorbed moisture from the air to a slight extent, when kept in cheese-cloth covered vessels. Experiments are now in progress to ascertain the effect of dry and moist air, respectively, on extracted honey. The investigation with ripe and unripe honey will be further proceeded with.—F. T. SHUTT.'

STORING HONEY FOR FAMILY USE.

I would like to give a word of warning about keeping honey in homes. When people purchase their honey supply, they usually put it down in their cellar. You could not put it in a worse place, because honey draws in moisture. I would say, keep your honey in a warm room, in a pantry or some warm place where it will not be exposed to dust, and where it will be in about the same temperature as in the hive.

PREPARATION FOR WINTERING BEES.

In the autumn, when it is time to put the bees into their winter quarters, we try, as much as possible, to have the hives and bees weigh 50 pounds each per colony. If the weight is under 50 pounds, I would advise putting in full frames of sealed honey in the hive, so as to make up the weight required.

Q. You do not feed them at all during winter ?

A. We do not feed them, for early in the autumn we have seen that each colony has sufficient stores to carry them over the winter. Feeding bees is a very tedious work. I would not recommend any one to do it. The principal difficulty is, that if you feed one colony, bees from the other colonies will find this out, and will soon rob this one ; and when robbing is started, it is exceedingly difficult to put a stop to it.

Q. Do you feed sugar to your bees ?

A. We do, during the time between the clover bloom and the fruit bloom. At that time we must watch colonies closely, and, if they have no honey in their frames to keep up brood-rearing, feed them.

Q. How does the sugar-fed honey compare with that from flowers ?

A. We dare not feed sugar syrup to make honey. We only feed it as food for the bees. There is a law against that, and we have to be careful to feed only what the bees require for their needs.

A TEST TO DETERMINE IF BEES INJURE ORCHARD FRUITS.

Another of our experiments was to find out whether bees would injure sound fruit, the fruits with which these tests were conducted being peaches, pears, plums and grapes, as well as raspberries and strawberries. For many years the question has been under discussion, but last year special attention was drawn to it by a lawsuit brought by a grower against a bee-keeper, the former claiming that his fruit had been seriously injured by the bees of his neighbour, while the bee-keeper brought evidence to show that not only was this not the case, but that it was impossible. We have conducted these experiments carefully, and we find that it is impossible for bees to puncture the fruit and take out the juice. If bees feed on fruit, it must have been punctured before or broken by the person picking it. We tried this fruit in the hives, on trees, some with honey on, and other fruit we punctured holes in with a pen-knife. Where honey had been put on the fruit, the bees licked it clean, and where holes had been cut with a pen-knife, they went at it, and finally the fruit became decayed where these marks were made. We also kept fruit in the workshop and treated it as we treated it in the hives. We came to the conclusion that where fruit has been sucked by bees, the punctures were not made by the bees themselves : it must have been punctured before.

The question was of so much interest to bee-keepers that the following experiments were undertaken to determine whether bees, even when deprived of food, would attack fruit placed within their reach. During the summer of 1901, when there was no surplus honey to be gathered from plants outside, experiments were made with ripe fruit of the four kinds I have mentioned, exposed in different places near our apiary, where it was easily accessible to the bees. The experiment was repeated during the season of 1902, with the addition of raspberries and strawberries. All the fruit was placed in the same position as in 1901, that is, in the hives, on trees, and in a workshop adjoining the house apiary.

Peaches, plums, pears and grapes were exposed in three different positions—whole, without any treatment ; whole, after having been dipped in honey, and punctured in several places with the blade of a pen-knife. Four colonies of about equal strength were selected for the experiment. Each of the colonies was in a hive, upon which was placed a super, divided in the middle by a partition. From two of the hives the honey had all been removed, and in the two remaining, five frames were left, each having considerable brood with honey around it. In each one of the four hives the whole specimens of fruit not dipped in honey were hung within three empty frames, tied together as a rack. The whole specimens of fruit which had been dipped in honey were placed in one compartment of the super, and the punctured specimens were placed in the other.

Bees began to work at once upon both the dipped and punctured fruit, and the former was cleaned thoroughly of honey during the first night. Upon the punctured fruit the bees clustered thickly, sucking the juice through punctures as long as they could obtain any liquid. At the end of six days all the fruit was carefully examined. The sound fruit was still uninjured in any way ; the dipped fruit was in a like condition, quite sound, but every vestige of the honey had disappeared ; the punctured fruit was badly mutilated and worthless, beneath each puncture was a cavity, and in many instances decay had set in.

The experiment was continued the following week. The undipped sound fruit was left in the brood chamber, the dipped fruit was given a new coating of honey and replaced in the super, and a fresh supply of punctured fruit was substituted for that which had been destroyed. At the end of the second week both the undipped and the dipped specimens of fruit that were sound at the end of the first week, as well as the

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punctured specimens, were considerably decayed, and, where there were any openings in the skins, showed signs of having been worked on, though to no very great extent. For the third week fresh samples of fruit of the four kinds were used. The result was very similar to that of the first week, and, as it was late in the season, some of the fruit that had been put in sound had begun to decay.

After the third week the bees in the two hives which had been deprived of all their honey appeared to be very sluggish, and there were many dead bees about the hives. The weather, being cool and damp, was very much against these colonies. They had lived for the first three weeks on the punctured fruit and on the honey of the fruit which had been dipped, as there were at that season too few plants in flower from which they could gather nectar. These bees had, therefore, died of starvation, notwithstanding the proximity of the ripe, juicy fruit. This supply of food, which they were urgently in need of, was only separated from them by the thin skin of the fruit, which, however, this evidence seems to prove they could not puncture, as they did not do so. The mean weight of each of these two hives on September 5, when the experiment began, was 24½ pounds; at the end of the experiment, four weeks later, each had lost 3¼ pounds. The mean weight of the two hives in each of which five frames with brood and honey had been left was at the beginning of the experiment 36¾ pounds; the mean loss for each of these hives at the end was 1¾ pounds.

In the experiment where the fruit was exposed in the open air, hung from the branches of a tree in the apiary inclosure, three sets of whole fruit were used, one being dipped in honey, one left undipped and whole, and a third punctured as before. The bees worked on the dipped and the punctured fruit, but were not seen to work on the undipped fruit, which remained perfectly whole. The same sets of fruit were used for the experiment where we exposed the fruit on shelves in an adjoining workshop. The bees worked both on the dipped and the punctured fruit, but only an occasional bee was noticed vainly looking for an opening on the whole undipped fruit.

Ripe fruit of four sorts of strawberries, the Williams, Clyde, Bubach, and Warfield, was exposed on July 2 of last year in the same positions as the other fruit, every care being taken that all the fruit used in the experiment should be perfectly sound. The fruit exposed inside the bee hives was exposed in three different conditions—whole fruit without any treatment, whole fruit that had been dipped in honey, and fruit of which each berry was cut in two. The arrangements were precisely the same as for the experiments with large fruit. The bees began to work at once upon the dipped fruit in the hive and kept continually on it as long as any honey could be obtained. They also clustered thickly on the whole berries and on those cut in two, but did not appear to be getting or even trying to secure any substance from them. The fruit exposed on the branches of trees and on the workshop shelves was not visited at all by the bees but decayed and dried up. In the hives all fruit decayed more quickly from the extra heat from the bees. This experiment lasted one week.

Four varieties of raspberries were experimented with—the Red Purple, Very Light Coloured, and Black Cap. On July 29, some berries of each were placed in the hives in exactly the same positions as the strawberries. At this date there was considerable honey coming in and the bees did not touch any of the raspberries.

HOW TO MANAGE A HOUSE APIARY.

I would like to give the Committee some hints as to the arrangement and management of a house apiary. We have many visitors making inquiry and we receive many inquiries by letter, especially from people with no land who wish to know how they may keep an apiary, and we are able to answer them that they may readily have what we call a house apiary. We tried this experiment ourselves and found it would be done successfully in an ordinary shed. For this we cut holes in the wall facing the south opposite the entrances to the hives, which are set on the floor three or four feet apart. Another season we placed a second tier of hives 4 feet above

the first, and cut a second row of holes opposite the entrances. These hives also did very well. From our experience I would therefore say that a house apiary in the city can be successfully managed. The only trouble would be when the swarms come out. They are apt to fly out and get lost. To avoid that a queen or drone trap may be placed at the entrance of each hive; then the queen, being larger, cannot come out though the workers will be able to go out and do their work. The queen will get up into the trap and can then be transferred to a new hive. The chances are the swarm will be found clustering on the outside of the trap, where they can be readily secured. Another way to prevent the loss of the swarm is to cut one of the queen's wings. But by so doing you are apt to lose her. If the house apiary is high up, she is liable to drop down to the ground and be lost; but, if it is close to the ground she is easily found. If the swarm come out and do not find their queen with them, they quickly go back to their hive.

This house apiary opens into a yeard 30 feet by 60, surrounded by a close-board fence, 6 feet high, which gives an excellent shelter from prevailing winds. Both the south and east sides of the shed are covered with grapevines, which seem to keep the building cool during the very hot weather, and the vines are trained so as to leave the entrances perfectly clear. One part of the space in the shed devoted to this purpose faced the south-east and was 7 feet high, 6 feet long and 4 feet wide. In this portion we placed two tiers of hives. The bottom tier was set on the floor, which is 1 foot from the ground and double-boarded, and the second tier was set on a shelf 3 feet 6 inches from the floor. Another portion of the shed, facing the south-west, was 7 feet high, 4 feet wide and 32 feet long. There were here 12 hives in one row upon the floor.

From the experience gained with the first part I have mentioned, I would recommend two tiers on the south-west side, so that the vacant space might be profitably occupied. The entrances to the hives were cut through the wall of the shed, and were 3 feet apart, being 6 inches square, with an alighting board projecting, 7 inches x 12 inches wide and sloping, so as to throw off rain. The hives were set close to the wall, so as to confine the bees to their own hives. During the past two summers the colonies in the house apiary, having more shelter from the cold winds of both spring and autumn, were frequently observed to be flying, while the colonies in the exposed, open apiary remained in their hives. Another advantage of this arrangement is, that there is less danger of robbing. When the hives are being inspected, the examination is obviously more convenient in wet weather, as they are under shelter. If the apartment were made 6 feet wide, instead of 4 feet, and a shelf placed on the wall to hold bee appliances, this would add greatly to its convenience. The alighting board might be made to project only 6 inches, and be 10 inches wide.

SUGAR SYRUP FOR WINTER STORES.

I have next to detail to you some experiments in the feeding of sugar syrup for winter stores. These experiments were begun during the autumn of 1900 with four colonies of bees, and were continued in the autumn of 1901 with eight colonies, the extra four being the progeny of the first four. All the natural stores having been removed in September, a Miller feeder was placed in an empty section super, close to the top of the brood frames, any part of the brood frames not covered by the feeder being covered with a propolis quilt, cut so as to allow the bees a passage through it. By keeping the feeder well packed around, except where the bees enter, the heat is kept in, and at the same time they cannot daub themselves with the liquid. In these experiments the bees had a constant supply of syrup, which was made of the best granulated sugar, two parts to one of water by weight. The water was first brought to a boil and the boiler then set back on the stove, and the sugar having been poured in, the mixture was stirred until all was dissolved. The syrup was supplied to the bees at about blood heat. When the hives were put into winter quarters, the wooden covers were removed and replaced with a chaff cushion. The hives were also given extra ventilation at the bottom by

placing at the entrance a wooden block between the brood chamber and the bottom board, raising the front of the brood chamber about 2 inches extra.

In 1901, the eight colonies were put into winter quarters on November 9, their average weight being 57¾ pounds per colony. When taken out, in the spring of 1902, they averaged 46¼ pounds. All came out in excellent condition, there were very few dead bees about the entrance, the bottom board was quite clean, and there were no signs of dysentery. The hives were set out on their summer stands on March 22, the temperature being 55 degrees and the day clear, bright and mild. For the following ten days the weather was very fine and warm, the bees were flying well and built up rapidly, and they were in excellent condition when the honey flow came on. The first pollen gathered was noticed on April 1, but many bees were seen before that date, gathering sap from fresh-cut maple tree stumps or wherever a maple had been injured. During the summer each colony gave one swarm and made on an average 41½ pounds of honey, this being considerably below the yield of 1901, but the results were quite satisfactory, considering the damp, cool season.

The result of our experiments shows that feeding syrup for winter stores can be done successfully, but only by an experienced bee-keeper. Many people think they can take out every particle of honey and feed back syrup. That is not advisable, as by so doing you get a very inferior quality of honey. The honey that comes out of the frame where broods have been raised for years will be tainted with a most unpleasant flavour. Such honey is a detriment to the honey market. I have often said that there should be some protection to the people who purchase honey, in the same way that protection is furnished to people who buy butter, and seeds, and other things. While going through the market, you can sometimes smell this honey long before you get to it. Full combs of honey from frames which have been in the brood chamber for years are sold in the same manner. To my mind, this should not be allowed. People buy this honey, eat it, are sickened by it. If this practice could be stopped, it would be very much better for the people, as well as for the honey industry.

DIRECTIONS FOR WINTERING BEES.

We have tried very extensive experiments in wintering bees in the following situations :—in the cellar of a private house ; in the root-house where the roots are kept ; in a pit, that is, a hole dug in the ground on a hill side ; out of doors, on their summer stands, and also in the house apiary. We found that wintering in the cellar is the best method in this section of the country, and I am safe in saying, it is better to winter in the cellar in any section of the country where the thermometer goes down to 10 below zero. The amount of honey consumed by outside wintering will be about one-fourth or one-half more than it will be by wintering inside ; in that it compares very favourably with the wintering of animals : if you winter an animal out around a straw stack, it takes very much more feed to keep up the animal heat. It is the same with bees.

Keep the bees at an even temperature, and in a fairly good cellar; it is not necessary that the cellar should be perfectly dry. The best way to arrange the hives in the cellar is to place a block about three inches thick under the entrance to the hive so as to raise them from the bottom board. Most people when they have purchased two or three hives, think that they must prevent the bees from coming out of the hives during winter and put wire gauze over the entrance; the inevitable result is that they smother their bees. It is far better on the contrary to give them free ventilation at the bottom.

We have also tried other experiments by removing the cover or top board and putting on cushions instead. This chart here shows the hive with a 3-inch block under the entrance which you will notice is wide open. Too many bee-keepers, as I said before, close the entrance entirely as they think to keep the bees in the cellar ; but the bees will try to get out all the more when they find they are shut in, more than they will when they have plenty of ventilation. The object of the cushion on the top of the

hive is to keep in the heat and to absorb the moisture. Most people keep their colonies without removing the bottom part or without removing the cover; then, if the swarm is very large, it will generate a great deal of moisture and the combs will get moldy; and drops of water will form about the entrance. I would say: Keep your bees in the cellar, give them plenty of ventilation, remove the cover and put on cushions. I should have said that we cannot successfully winter out bees out of doors in this country. We have tried this with extra packing around the hives and we have tried them out on their stands, as they do in the western part of Ontario. We found that more than half of the colonies died. Then we tried to winter in the house apiary; the house apiary is very successful for summer management, but will not do in this section of the country for wintering. We found that the changes in temperature are too great. On a day when the sun shines and is fairly warm, the bees will come out for a flight and then become lost. If you have not a cellar, a pit answers very well, or even a root-house.

By Mr. Tolton :

Q. Is there any danger of mice in your cellars ?

A. There is. We were greatly troubled with mice and rats in the cellar of the Experimental Farm for the first two or three years, and we could not get them away. We set traps and poison, but the cellar was so poorly built that we had to put in concrete flooring, and cement up the crevices through which the mice got in. After that we had no more trouble. For any person keeping fifty colonies of bees, I would say it would pay to put in a cement flooring and cement up the crevices. He would soon make up by the saving in winter stores for the cost of cementing.

By Mr. LaRivière:

Q. What temperature is required in the cellar to keep the bees ?

A. About 45 or 46 degrees.

Q. Have you many inquiries from the different parts of the Dominion with regard to your experiments in bee-keeping at the farm ?

A. We have a great many.

Q. Which are the principal points in the Dominion where bee culture is more extensive ?

A. We get more letters from Nova Scotia and New Brunswick than from any other part, though I do not know that they have any organization of bee-keepers in that part of the Dominion. We get some inquiries from Quebec and Ontario, but not as many as from Nova Scotia and New Brunswick.

Q. What is the result of bee culture in Manitoba ?

A. We get a few letters from there, very few.

Q. Have you any statistics as to the amount of honey produced in the respective provinces ?

A. None at all, sir. The apiary at the Experimental Farm is simply a side issue, as it might be called. I simply put in an hour or two in the evenings in that branch of work.

Q. Do you not think this industry is of such importance that it should require more time ?

A. I certainly do.

Q. What is the amount of honey that is produced in this country for the market, either home or export ?

A. I have never ascertained that.

Q. I think it would be very interesting to ascertain the amount produced in the country, because I understand it is a very important industry ?

A. It certainly is. If I had had time to go over our work more thoroughly, I think I could have shown you something, perhaps more interesting than the notes I have laid before you here. If I had more time at my disposal at the Experimetal

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Farm to devote to this branch of the work, I could gather up a great deal of information on the subject of bee-keeping and have more data to present to you.

Q. Are these charts such that they can be included in your evidence ?

A. They are, but I would have to explain each one of them separately.

Q. Of course, but one reading your evidence, unless he has the charts before him, could hardly understand your statements. If you have the description of the charts in type already, it would not cost any more to put them with the other evidence, as has been done in many other cases before this Committee ?

A. I am sorry that I have not these descriptions in type, nor have they ever been printed.

Q. Some of these are very interesting indeed.

By Mr. Robinson (Elgin) :

Q. That large diagram there shows a honey extractor ?

A. Yes. I was in hopes that I would be able to commence my remarks at the beginning of apiculture and go right through, giving instructions how to manage an apiary and describing the different hives and all the appliances, but time does not permit at present.

By the Chairman :

Q. Well, we hope that you will live to give evidence before the Committee another year.

A. These are three of the charts I take to the farmers' institutes during the winter; I have not so much to do at the farm then, and sometimes the Minister of Agriculture or the Director of Experimental Farms requests me to attend farmers' institutes and give a talk on bee-keping, and I take these charts with me and explain them very fully, to tell the people how to manage bees from spring to spring.

A BEE-HIVE PEST,—REMEDY FOR.

One of the worst pests in bee-hives is the Bee Moth (*Galleria mellonella,* L) more properly called the Wax Moth, the most troublesome of the enemies of the bee-keeper. The full-grown caterpillars or 'grubs' are very active, of a dirty white colour ; when full grown, about an inch in length. They sometimes occur in large numbers in neglected hives, and eat long galleries through the comb, feeding on the wax and the bee-bread in the cells, destroying also any young bees that come in their way, and finally driving the colony from the hive. The eggs of the Wax Moth are very small, oval, glistening white at first, but assume a pink colour before hatching. They are inserted by the mother moth into any crack or crevice in or about the hive, by means of a long tube-like ovipositor. As soon as the young caterpillars hatch, they begin to spin, as a protection, a silken tube, in which they live during their whole larval life. This tube is enlarged and extended as they progress. When full grown, they leave these tubes and creep into a crevice or corner, generally near the bottom of the hive, where they spin a tough cocoon of white silk, mixed with pellets of black excrement. The pupa may be found inside the cocoon. The perfect insect is figured of natural size, a female with wings expanded, and a male at rest. There are normally two broods of this moth in the season, the first appearing in May, and the second, usually more numerous, in August. In infested combs brought into a heated office for study, the moths appeared at the end of March and through April, well into May. The moths are of various tints of dusky gray and differ a good deal, some being much lighter in colour than others, and some specimens of both sexes being of a more ruddy brown. They are not easily seen when at rest, as in colour they resemble very closely old weathered wood, a resemblance which is heightened by numerous dark spots on the wings. The peculiar shape of the wings, as is shown in the figure above, will easily enable any one to identify this insect. The moths are about three-quarters of an inch long, and when at rest, the

wings are folded so as to leave a narrow, flat space at the top, and then slope downwards abruptly. When disturbed, they run with great rapidity and slip quickly beneath any available shelter. They fly with ease, and enter bee-hives about dusk for the purpose of laying their eggs.

The indications of the presence of the Wax Moth grubs in a hive are well known to most bee-keepers. If the little black pellets of excrement, like small grains of gunpowder, mixed with bee-bread or broken cappings, are at any time noticed on the bottom board around the entrance, the hive should at once be carefully examined and steps taken to remove any caterpillars that may be found. If attended to promptly while the grubs are few in number, this is an easy matter, but if they are neglected and allowed to increase, as they will very rapidly in the spring, much destruction will be wrought in a surprisingly short time. When a grub is detected, it should be picked out with a knife or other sharp instrument (a pair of fine but stiff tweezers will be very convenient) and crushed. There will, of course, be some injury to the comb, but this the bees will soon repair. When the grubs occur only in small numbers, the bees will, as a rule, if the colony be of proper strength, keep them down themselves. Italian bees are rarely injured by moths. The wide-awake bee-keeper will also provide against weak and queenless colonies, which, from their enfeebled condition, are the surest victims to moth invasion. No bees, either Italian or Black, will be troubled so long as the combs are covered with bees. If, through carelessness, a colony has become thoroughly victimized by these wax-devourers, the bees and any combs not attacked should be transferred to another hive, after which the old hive should be fumigated with sulphur. Then, by giving one or two of each of the remaining combs to strong colonies, after killing any pupæ that may be on them, they will be cleaned and used ; while, by giving the weak colony brood, and, if necessary, a good queen, it will soon recover.

The following experiment was carried out. Two hives which had been deserted by their swarms in the autumn, were left in the bee-yard until the bees were taken into the cellar for the winter; both hives were full of empty combs, and had many evidences of the presence of the Wax Moth grubs. One of these hives showed more injury than the other. The one which had the most grubs was closed up tightly and was left in the house apiary for the winter, where it was exposed to the winter frosts to destroy the grubs. It was examined at different times and was kept in the same place until the swarming season the next year, when, as all the grubs of the Wax Moth were killed, it was given to a new swarm, and was as good as if there had never been a grub in it. The other hive, which at first showed the least symptoms of injury by the Wax Moth, was kept in the bee cellar where the temperature would average about 45 degrees during the winter. This hive was also tightly closed at the top and bottom like the former, so that no moth could either get in or out. In the spring, when carried out at the time the bees were set out, it was found to contain hundreds of grubs and winged moths. The comb had been entirely destroyed and was bound together into a solid mass by the webs. From this experiment and others, as will be seen by the Report Entomologist and Botanist, 1895, pages 174-177, it is clear that freezing is a good method to keep down the Wax Moth in all localities where the thermometer drops to zero, Fahr., during the winter.

All empty combs should during the winter be suspended from strands of wire stretched across a dry shed, so that they will be safe from mice, but at the same time exposed to the full intensity of the winter cold. During the summer, while not in use, all empty combs should be kept in a dark cellar and examined at short intervals.

DISEASE OF THE HONEY BEE,—REMEDY FOR FOUL BROOD.

One of the most troublesome diseases of the honey bee is Foul Brood. Some of the brood fails to hatch. Cappings here and there are sunken and perforated at the centre. On opening one of these cells there will be found a dead larva lying on one side of the cell, somewhat shrunken, and of brownish colour, varying from a light pale brown

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to a dark brown. In more advanced stages the brown is of the colour of a roasted coffee-berry. In the incipient stages the brown is of the colour of the coffee we drink, when greatly diluted with milk. But, so far all these symptoms may be present as the result of chilled, overheated or starved brood. But to determine whether the disease is the real foul brood, run a tooth-pick into the dead larva and then draw it slowly out. If the matted mass adheres to the end of the pick, and finally the thread breaks when the pick is drawn back, it is probably a case of foul brood. In all other forms of dead brood, with perhaps one exception, this ropiness does not appear; but with foul brood it invariably appears. Now, there is another symptom ; and that is, the odour, while not exactly foul, resembles greatly that from a cabinetmaker's glue pot; and when the disease is pretty well advanced in the hive, the odour will make itself manifest upon lifting the cover or quilt, even before exposing the brood. If other colonies are affected in a similar way, and the disease appears to spread, it is unquestionably a case of foul brood.

The following method of curing foul brood is recommended by Foul Brood Inspector McEvoy, of Woodburn, Ont.:—

'In the honey season when the bess are gathering freely, remove the combs in the evening and shake the bees into their own hives ; give them frames with comb foundation starters on and let them build for four days. The bees will make the starters into comb during the four days and store in them the diseased honey which they took with them from the old comb. Then in the evening of the fourth day take out the new combs and give them comb foundation to work out, and then the cure will be complete. By this method of treatment all the diseased honey is removed from the bees before the full sheets of foundation are worked out.

All the old foul brood combs must be burned or made into wax after they are removed from the hives, and all the new combs made out of the starters, during the four days, must be burned or made into wax, on account of the diseased honey that would be stored in them.

All the curing or treating of diseased colonies should be done in the evening, so as not to have any robbing done or cause any of the bees from the diseased colonies to mix and go in with the bees of sound colonies. By doing all the work in the evening, it gives the bees a chance to settle down nicely before morning and then there is no confusion or trouble.

This same method of curing colonies of foul brood can be carried on at any time from May to October, when the bees are not gathering any honey, by feeding plenty of sugar syrup in the evenings to take the place of a honey flow. If foul-broody colonies were worked with in warm days, when bees are not gathering honey, it would set them robbing and make them spread the disease; for that reason all work must be done in the evenings when no bees are flying.

Where the diseased colonies are weak in bees, put the bees of two, three or four hives together, so as to get a good-sized swarm to start the cure with, as it does not pay to spend time fussing with little weak colonies.

When the bees are not gathering honey, any apiary can be cured of foul brood by removing the diseased combs in the evenings and giving the bees frames with comb foundation starters on. Then, also, in the evenings feed the bees plenty of sugar syrup, and they will draw out the foundation and store the diseased honey which they took with them from the old combs; in the fourth evening remove the new combs made out of the starters and give the bees full sheets of comb foundation and feed plenty of sugar syrup each evening until every colony is in first-class order in every respect.

Make the syrup out of granulated sugar and put one pound of water to every two pounds of sugar, and then bring it to a boil. As previously stated, all the old combs must be burned or made into wax when removed from the hives and so must also all the new combs made during the four days.'

The empty hives that had foul brood in, do not need any disinfecting in any way. I have handled many hundreds of colonies in the province of Ontario, and cured them

of foul brood without getting a single hive scalded or disinfected in any way, and these colonies are cured right in the same old hives. In my judgment, resulting from experience, it is the greatest folly to waste any time over the empty hives, as there is no more reason for scalding empty hives that foul brood had been in, than there would be to scald the feet of all the bees that travelled over the diseased combs. No colony can be cured of foul brood by the use of any drugs. All the old combs must be removed from any diseased colony, and the honey got away from the bees before brood rearing is commenced in the new clean combs. Foul brood apiaries are cured every year in the province of Ontario by my methods of treatment, which I have given here.

By Mr. Robinson (Elgin):

Q. How many hives of bees do you keep there ?

A. Fifty.

Q. And you sell the honey ?

A. We sell the honey, and we send very large exhibits to expositions both in Canada and in foreign countries. We have sent a very fine exhibit to England, Scotland, to Ireland and France and to the United States. The last exhibit went to Japan.

Q. Did you get any prizes ?

A. We never compete for prizes. All government exhibits have to go without competition.

The question was asked as to whether we have any means of detecting whether bee-keepers feed sugar or mix sugar with the honey or sometimes load the bees with sugar to transform it into honey. Mr. Shutt has examined samples in the laboratory at different times in the year. The worst difficulty we find is with extracted honey which has been subsequently adulterated. A good deal of that adulteration is done in the country. Attention was drawn to it at the Ontario Bee-Keepers' Association last year, and when analyzed by Mr. Shutt, samples were found with very little honey in them.

In my opinion, gentlemen, the keeping of bees is an industry that is well worth attention and one that can be made very profitable. If this industry had had something like the attention that the dairy industry has had and a number of our other industries, I have no doubt, we could very soon have a very large export trade in honey. For, as it is at present, half of the requirements of the home market are not supplied. There is no question for instance but that, if experiments were carried on with different clovers to find out which are the best honey-producing varieties that would produce a large amount of honey, as well as good fodder for stock and increased fertility to the soil, a great deal of good would be done to the country.

Q. When the bees swarm do you attend to them yourself ?

A. Yes, sir, I do, as much as possible; or else I have some one else to watch during the swarming season.

Q. Do you have any difficulty in swarming them ?

A. Not at all.

Q. Do you put on the veil ?

A. Yes, I put on the veil. I cannot be there all the time myself, and any one else can watch them. When the swarms come out, they generally light on the limb of a tree. Our trees in and around the apiary are low; so, we do not require the long swarm catcher apparatus. All we have to do, is to carry an empty hive under the limb and give the limb a jerk; the swarm drops at once down before the entrance to the hive and the moment the bees see it they go in and take possession.

Q. Do you ever lose any bees in swarming ?

A. No, sir, never.

By Mr. Tolton :

Q. Will your method of curing foul brood appear in the report ?

A. Yes.

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Q. Foul brood is very dangerous among the colonies ?

A. The method is Mr. McEvoy's, the official Foul Brood Inspector of Ontario, who is very successful, and the plan that I have given for diagnosing the foul brood is from the A. B. C. of Bee Culture published by A. I. Root. We never have had any case of foul brood in this part of the country, as far as I am aware.

Mr. TOLTON—There is some in the county I come from.

BEE STING,—HOW TO TREAT IT.

The WITNESS.—That figure at the end of the chart represents the bee sting which frightens many people from going into the bee industry. The sting of course is much enlarged here. It may be proper for me to tell how to look after the injury in case you are stung. You will notice the sack of poison at the base of the sting ; it is much like a rubber bulb, so when a person is stung, he usually tries to pull the sting out. This, however, only forces the poison into the wound. When you get stung the best way is to brush the sting off and the chances are you will not feel any ill effects, as the side pressure will burst the bulb, and the poison instead of entering the wound, will be forced out.

MR. ROBINSON *(Elgin)* : I think the Committee might suggest to the Director of Experimental Farms that more attention should be devoted to Apiculture. To my mind, it is one of the industries that should be looked after ; for, as we have just heard, it is very remunerative, and it does not require a great deal of work. In fact, it is a sort of amusement to have bee hives around the house, and I believe we should direct the attention of our farmers to the importance of that kind of culture and to the profits they can derive therefrom.

Having read over the preceding transcript of my evidence I find it correct.

JOHN FIXTER,

Apiarist, Central Experimental Farm.

RAISING FRUITS AND VEGETABLES

HOUSE OF COMMONS,
COMMITTEE ROOM 34,
FRIDAY, July 3, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock a.m., the Chairman, Mr. DOUGLAS, presiding.

Mr. W. T. MACOUN, Horticulturist of the Central Experimental Farm, was present, on call of the Committee, and was examined as follows :—

Mr. Chairman and Gentlemen, it is a great pleasure to me to have this opportunity of giving you an account of some of the work I am doing in my division at the farm. I have a large division there, and it is not possible to go into all the work ; but I have chosen a few of the experiments I am carrying on, which have not been brought prominently before you before. The work of my division may be divided into three parts. The first is that relating to experiments with fruits and vegetables. Then, I have charge of the arboretum and botanic garden, where species and varieties of trees, shrubs and herbaceous perennials are being tested to determine their hardiness and to learn as much about them as possible, especially from a botanical point of view. These are obtained from all parts of the world in which plants grow, that will be likely to live in our climate. We have now a large collection in what is hoped will be the national botanic garden. I have also charge of the forest belts, where we are trying to obtain information regarding the rate of growth of the best timber trees. These trees are in blocks of a single species and in mixed plantations. Every year, trees are measured, and the results are given from time to time in our reports. The work in connection with the forest belts was brought more fully before this Committee a few years ago.

By Mr. Wilson :

Q. Are the trees planted in different soils ?
A. Yes, we have them in different soils.
Q. You are particular to have that ?
A. Yes.

By Mr. Robinson (Elgin) :

Q. And different distances apart ?
A. And different distances apart. I may say that, at the recent meeting of the Canadian Forestry Association, I read a paper giving an account of our fifteen years' experience with trees in the forest belts, showing which kinds have succeeded and which have not succeeded in this district, and the best soil for each. For instance, the Black Walnut, which is very hardy at Ottawa and will give a splendid growth, makes very little growth if it is planted in wet or cold ground ; but if planted in warm sandy loam, it will do well.

In the division of fruits and vegetables, the principal experiments carried on have been the testing of varieties, methods of cultivation, cover crops, spraying, growing seedling trees to originate new varieties, and the testing of different methods of plant-

ing different sorts. Then, in connection with vegetables, we are growing a great many different varieties, planted in different ways. We are carrying on various experiments with them. I would like, this morning, to refer briefly to our experiments with potatoes, especially that in regard to the spraying of potatoes for the prevention of potato blight.

KEEPING ORCHARD RECORDS.

Before going into any special experiment, I wish to refer to the system of keeping records in my division, as it will give you an idea of how useful it is to keep an accurate register of our experiments and results, and in a systematic way. I have brought some of the books with me to show you. This, for instance, is the one containing a record of our plum orchard. It is divided into headings right across the page, with columns down. This line gives the name of the variety, the row in which the tree is and its position in the row, and every year, notes on the following, or nearly all the following matters are taken. The headings are used for—the year the notes were taken, how the tree wintered, when it began to bloom, when it was in full bloom, the amount of bloom, the date the bloom fell, how it was affected with the disease called the shot-hole fungus, the growth during the season, the amount of crop, the size of the fruit, the date when picked, the quantity picked, the amount of windfalls—the latter with special reference to apples—the total of windfalls, and the total crop.

By Mr. Wilson :

Q. You want another column.

A. What is that for ?

Q. The cost.

A. Yes, we could put that in ; but it is hard to keep the cost of each tree. I have an experiment later on in which I will give you the cost. This other book belongs to the same orchard after five years ; the records have been entered in it from year to year. You can easily imagine that the information derived from averaging these records is very valuable. We cannot tell from one season's work what a tree is going to do, or whether it will be profitable or not ; but, having the record of a number of years, the average obtained gives us valuable information. Every few years these records are copied from this first book, as, you see, it gets into rather bad condition through being carried about in all sorts of weather, into a more permanent book, where we plan to have the records run for twenty-five years on one page. So that, if any one were to ask us to tell him how a certain apple produced in any year, we should at once be able to turn up this book and give him full information.

Q. Do you not print these every year in the annual report ?

A. No.

Q. You do not print these ?

A. Not the details.

By Mr. Smith (Wentworth) :

Q. But you put in a summary of it ?

A. Yes, we have a summary of it. Now, I might take up three or four of the principal headings, to give you an idea of the value of keeping these records. For instance, take the time of blooming of fruit. It has been found that many varieties are self-sterile to their own pollen ; that is, if growing alone, the fruit will not set, or if it does, it will be very sparingly. It requires some other variety growing near to get a profitable crop of fruit. This is particularly the case with the improved American plums. Although there are 200 varieties of these plums, it has been found that only one will produce fruit when self-pollenized. You will thus see the importance of being able to tell a man which varieties will bloom at the same time, as, if he knows this, it will help him to get a good setting of fruit. Then, in regard to the amount of bloom, we have found that certain trees will produce a very large amount of bloom, and,

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though they have other trees around them which should pollenize them, they do not set much fruit. Records like these, kept for a number of years, enable us to investigate to find out the cause. Sometimes it is found that it is due to a disease of the twigs, a blight which prevents the pistils forming properly, or sometimes it is found that the flowers are not properly developed.

Then, with regard to windfalls, all fruit-growers know that it is very important to have a variety, if possible, the fruit of which will not drop badly in the autumn. In September there are, as a rule, very high winds, and large quantities of fruit fall to the ground. If varieties can be planted which will not drop badly, instead of varieties which will drop badly, it is a great advantage to the fruit-grower and the country at large.

By Mr. Wilson :

Q. Have you found out the cause of dropping ?

A. There are several causes, but some varieties drop more easily than others. For instance, one cause of dropping is drought. Drought will cause a great deal of dropping of fruit, and then the winds would also cause much dropping. There is also the dropping now taking place, known as the June dropping, which is probably due principally to the tree getting its proper equilibrium and from the flowers not being properly pollenized. There is a certain amount of fruit set which the tree cannot develop, and which it has to get rid of.

Q. Do you not sometimes pick it off, if a tree is too heavily loaded ?

A. Yes ; after this June dropping is over, if the tree is still heavily loaded, we sometimes thin the fruit out. This applies especially to peaches and plums.

By Mr. Ross (Ontario) :

Q. Generally, when they want to show an apple in the fall, fruit-growers leave one or two on the stem ; is that not so ?

A. Yes.

By the Chairman :

Q. Have you any instances of trees pollenizing themselves ?

A. Certain kinds of apples will pollenize themselves, if there is only one tree. For instance, the Duchess of Oldenburg will set good fruit if by itself. Then, we keep in this record the crop of picked fruit separate from the crop of windfalls, so that we are able to tell the proportion of good fruit which is picked from a tree, in distinction to the windfalls. I would like to refer particularly to one thing we have noticed in comparing our records, that is, the individuality of individual trees of the same variety.

DISTINCTIVENESS OF FRUIT TREES OF THE SAME KIND.

We have, growing at the experimental farm, quite a number of trees of the same kind, and, averaging the records for the last five years at the farm, we have found that some were producing more than twice as much fruit as others planted at the same time. We are going to continue this work to find if this variation in yield will hold good over a long series of years, because if it does—and past experience leads us to believe it will—it is going to be very important to fruit-growers. The advantage of strain, as you know, has been worked up very thoroughly in regard to live stock and to some plants, but in the matter of fruit not much has been done. Take the Northern Spy as an example. Very little, as far as I am aware, has been done to get a strain of Northern Spy which will begin to bear earlier and will bear more regular and better crops and finer-coloured fruit than the ordinary type, and yet I believe that much could be done to improve this variety, and I hope that these experiments will prove it is quite possible to get a strain of fruit which will be just as profitable in its way as an improved strain of live stock.

By Mr. Ross (Ontario) :

Q. How long before a Spy will begin to bear ?

A. That depends a good deal on circumstances. If the Spy is growing rapidly, it will take it ten or twelve or fifteen years. If it is on poor soil, it will begin earlier, and if it is topgrafted, you can get fruit in five or six years.

By Mr. Smith (Wentworth) :

Q. Grafted on what ?

A. We had it grafted on Wealthy and Duchess, but these proved very poor stock. The Northern Spy outgrew the Duchess and Wealthy, and during this last wind storm, on the 1st of July, a large part of the Northern Spy on one tree broke off. It had a very good crop, too.

Q. Are you testing it on other varieties ?

A. Yes.

By Mr. Ross (Ontario) :

Q. The Talman Sweet is a good stock ?

A. It is not hardy enough for this district. It makes a splendid stock, though, where it will grow. We are trying the Northern Spy now on several stocks to find which will make the best union and the best-shaped tree. The Northern Spy cannot be grown in this district in the ordinary way. The trunk sun-scalds, and the trees die; but topgrafted it does very well, but requires a strong-growing stock, such as Haas or McMahon White.

Q. Sun-scald, what is that ? Does the heat of the sun destroy the tree ?

A. Not exactly that. During the latter part of March, we often have warm days and cold nights, and the sun, shining on the south side of the tree, thaws out the sap, and when it goes down to near zero at night, the freezing again seems to destroy the tissue and separates the bark from the tree, and, as a result, the bark dies on the south and south-west side of the tree, and very often the tree dies, because the injury is so great.

RECORD OF FRUIT YIELD.

We are keeping records now of about 2,500 trees, trees of large fruits, and, returning to the question, I would like to read a few results of distinctiveness obtained from a variety of apples called the McMahon White. I have here a list of eight trees we had under test. They are comparatively young trees, so the crop for the past five years is given in gallons. It is the comparison of yields, not the amount, however, to which I wish to draw your attention :—

No. 1 gave 294 gallons.
No. 2 gave 159 gallons.
No. 3 gave 183 gallons.
No. 4 gave 136 gallons, as compared with 294 gallons from No. 1.
No. 5 gave 149 gallons.
No. 6 gave 149 gallons.
No. 7 gave 52 gallons.
No. 8 gave 105 gallons.

Now, No. 7 gave 52 gallons, in comparison with 294 gallons, but that tree and No. 8, although perfectly healthy, are considerably dwarfed, probably by the stock they were grafted on, and we do not know yet just how far the stock is influencing the crop on these trees. That is the line of work on which we are now engaged.

This year, we began topgrafting the scions from these individual trees on other stocks. For instance, we have now growing on a certain tree grafts from the tree yielding the greatest crop of fruit, and on the other half, scions from the tree yielding

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the lowest crop of fruit ; so that we hope to have on the same tree evidence to show that the scions from the poor-cropping tree will produce a light crop of fruit, and the scions from the big-cropping tree will produce a large crop of fruit, both getting their sap through the same trunk.

By Mr. Smith (Wentworth) :

Q. Were these eight trees topgrafted ?

A. No, they were root-grafted.

Q. And were the roots not all the same ?

A. No. They were nursery stock, and we do not know what the stocks were—probably ordinary nursery seedlings.

Q. They would be in all probability very much alike.

A. Yes, in all probability they would be very much alike; but on the contrary, some of them might be naturally rather dwarf trees. If you grow a thousand trees from seed, you will find quite a number of them that will not be thrifty, that will be rather dwarfed. If you graft a variety on these dwarfed trees, the probability is, the top will be dwarfed to a certain extent. That is one reason why Paradise stock is used, so as to get dwarfed trees ; but I do not know yet just how much the stock has influenced the cropping of the trees. One cannot tell, but I do not think, very much.

Q. I do not understand that these seedlings as they came from one lot would in all probability be all from one kind of seed. Of course if it was mixed apple seeds from the orchard here there would be different varieties, and there might be some differences in that respect, as no seedlings are exactly alike, but there would not be some of them dwarfed like the Paradise stock as a matter of fact. In the nursery we see no difference practically in the growth of one tree with another. We may have one hundred in a row all exactly alike.

A. We grew 3,000 seedlings from seed from Russia which were planted 5 x 5 feet apart to find out whether anything would be produced from them which would be superior in hardiness and of good quality. We have found that these trees vary wonderfully. Some are quite low growing and some spreading, some upright, some strong growers and others slow growers.

Q. We do not see that difference in orchard trees after they grow up ?

A. Not very much because with a great many trees the scion throws out roots and it is on its own roots in a short time. The unthrifty nursery trees also are not always sold and are destroyed.

Q. There is something in that.

A. I do not think, however, that as a rule we shall find that the stock has very much influence on the scion but I wished to point out that there is the possibility of its influencing the scion.

By Mr. Blain :

Q. At what age will the Northern Spy produce the best quality of fruit ?

A. I should think about 25 years of age. The Northern Spy would be in its prime at from 25 to 30 years of age.

These McMahon White trees that I spoke of have varied from 100 per cent down to 17 per cent. These eight trees have varied that much. The last two trees, as I said before, were considerably dwarfed. What that is due to I cannot say. It may be from the stock or from some other cause. There is another interesting point which is brought out in connection with these trees and which we have already started to work on, and that is the regularity of cropping of them. Some of these trees will bear a good crop one year and no crop the next year. Now, the most profitable tree, in my judgment, would be one which would bear a medium crop every year because prices will average better and I believe that in every way the results will be better and the tree will be more vigorous. For instance, here is one tree, tree No. 3, in 1898, the yield of that tree was 32 gallons, in 1899, it yielded 29 gallons. In 1900, it yielded 49 gallons,

in 1901, it yielded 18 gallons and in 1902, it yielded 55 gallons. Now, comparing that with another tree No. 2, which yielded almost as much, 42 gallons in 1898, then only 1 gallon in 1899, 6 gallons in 1900, 12 gallons in 1901, and 98 gallons in 1902. You see that tree only yielded a good crop once in four seasons and the same differences run through all the trees. I have here 17 trees of Wealthy, and 2 trees of Mackintosh Red. For instance we had in the Mackintosh Red a difference of between 100 per cent and 37 per cent. One tree of Mackintosh Red gave 158·5 gallons and another gave 59·5 gallons for the five years.

OFFICIAL LETTER INVITING FRUIT-GROWERS TO CO-OPERATE.

One cannot be sure that these trees will continue to show the same characteristics of cropping from year to year in the future, but I believe they will to a certain extent, and as I said before, we are grafting from these trees to find whether the characteristics will hold good when they produce fruit on other stocks.

By Mr. Smith (Wentworth) :

Q. That will be the valuable test.

A. That will be the valuable test, yes.

I thought it would be a good thing to try to get fruit-growers interested in this work as if there is as much in it as I believe and as the results suggest it will pay the fruit-grower who has to topgraft a great deal to take his scions from trees bearing the best fruit and the best crop of fruit. Some good fruit-growers do that. I know one man not far from here who grafts all his Fameuse apples from one tree, the fruit of which is particularly red in colour and preferable in every way. He believes he will get good red Fameuse from these trees, and I believe that if he does not get all red he will get a larger proportion of red than if he grafted without selection from any tree in his orchard.

The following letter was sent to fruit-growers who would be likely to co-operate in this work :—

HORTICULTURAL DIVISION,
CENTRAL EXPERIMENTAL FARM, OTTAWA,
May 1, 1903.

Co-operative Experiments in Recording the Yields from Individual Trees of the Same Variety.

At the Central Experimental Farm, Ottawa, the crop of fruit from each individual tree is recorded every year. One is thus able to tell at the end of a series of years how much each tree has borne. The yields for the past five years were recently tabulated and great variations were found in the total yields of trees of the same variety planted at the same time and growing under practically the same conditions.

As instances, one tree of McMahon White apple yielded 294 gallons, while another planted at the same time and under practically the same conditions yielded only 136½ gallons, or less than half as much. One tree of Patten's Greening yielded 136½ gallons, while another tree only yielded 31½ gallons, less than one-fourth as much. A young tree of Wealthy yielded 47½ gallons, while another of the same age only yielded 17 gallons.

Experiments are now being conducted at the experimental farm by topgrafting with scions from productive and unproductive trees, to determine how far the productiveness and unproductiveness of the trees is constant. The individuality of trees has long been noticed, but few figures have been published to prove this. The results obtained at the farm are hence of particular value.

If scions from productive trees will develop into productive trees when grafted, and if scions from unproductive trees will produce trees which are poor croppers it is very important that scions should be taken from the best yielding trees. This is done

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by some fruit-growers. In order that fruit-growers may obtain more knowledge of the great variations in yield of trees of the same variety planted at the same time and under the same conditions, we desire to start a co-operative experiment.

On application to the Horticulturist, Central Experimental Farm, Ottawa, six pieces of zinc, bearing six consecutive numbers, with wire attached, will be sent to each person. These pieces of zinc when received should be attached to six bearing trees of a single variety of apples, pear, plum or peach, the trees to be the same age and growing under the same conditions of soil and culture. The yield from each tree should be written in lead pencil on the zinc when the fruit is harvested. This yield should include the windfalls, and the windfalls gathered should be marked as such on the zinc labels. The quantity of picked fruit should also be marked as picked fruit. If it is not convenient for the fruit-grower to record the yields in the orchard on the pieces of zinc, as suggested, he may record them in the note-book direct.

When convenient later in the autumn, the yield for the year should be entered in a note-book, the number of the tree being entered so that the yields from each tree may be kept separate.

The yields from these trees should be recorded until it has been fully demonstrated that one tree is or is not more productive than another. All that is asked of the experimenter is to report the yield from each individual tree each year to the Horticulturist, Central Experimental Farm, Ottawa.

As grafting will, in all probability, become much more general among fruit-growers in the near future, the importance of knowing that trees vary widely in productiveness is easily seen. If the fruiting habit is continued in the grafted scion, as has been fairly well proven by experimenters, it is most important that scions should be taken from the most productive trees bearing the finest fruit.

W. T. MACOUN,
Horticulturist.

This circular was printed in several papers which had a wide circulation among farmers and fruit-growers, and we are getting a few to conduct this experiment, but there are not as many as I had hoped. This is the zinc label we have adopted. There are five years there marked with this heading, from 1903 to 1907, and then a small column for 'picked' and 'windfalls".

FRUIT RETURNS FROM CLOSELY PLANTED, WEALTHY APPLE TREES.

Another experiment which I should like to bring before your notice this morning is that of a small orchard of apple trees, which we have planted 10 feet x 10 feet apart. I would not recommend for general planting that the trees shall be 10 feet x 10 feet apart, but I believe that for special conditions and special purposes it will pay to plant the trees close together. We have found that in this part of the country, especially where our winters are severe, and where we have a great deal of sun-scald, we get better results where the trees are planted close than where they are wide apart : they are better protected, make thriftier growth, and we get better trees. We have about one-third of an acre planted with Wealthy apple trees, 10 feet x 10 feet apart. These trees were planted in this way for several purposes, but one of them was to find out what could be produced from these trees planted 10 feet apart, and whether it would be profitable to plant them at that distance apart. I would like to give you briefly the result of this planting, and then to make a few remarks upon it. These trees were planted in the year 1896, and the crops were taken up to the end of last year. The trees were planted 10 x 10 feet apart, to the number of about 435 to the acre, as compared with about 40 to the acre when planted in the ordinary way.

Q. Were these apple trees ?

A. Yes, Wealthy apples. The yields were not recorded until 1899, although there was a little fruit. They were rather large nursery trees. The total crop from this one-

third of an acre for the past four years—that is, the years 1899, 1900, 1901 and 1902—was about 131 barrels of apples, or at the rate of about 401 barrels to the acre. That is, the trees planted in 1896 had yielded, up to the end of 1901, a total of 401 barrels of fruit to the acre.

By Mr. Robinson (Elgin) :

Q. What kind of apple ?

A. The Wealthy.

Q. Do you consider that a good apple ?

A. For this district it is good, and for most of the districts where apples grow well it is one of the best fall varieties.

The total receipts from the sale of these apples was at the rate of $940.15 per acre, and the expenses were at the rate of $454.62 per acre.

By Mr. Smith (Wentworth) :

Q. Does that include the cost of the original planting ?

A. No, there is $150 to be added to that for the original planting, and care up to 1899.

Q. These are just the expenses in the period mentioned ?

A. Yes, the expenses for the period mentioned, but, as I say, the expenses were $150 from 1896 to 1899, including the cost of the 435 trees, the planting and the cultivation.

By Mr. Robinson (Elgin) :

Q. Do you charge anything for land rental ?

A. Yes, we charge for rental of land. I have prepared a list of expenses very carefully in my report, but there were some points I did not give in my report that I would like to bring before you, because it is a very interesting experiment, and I think, if any one who is going into fruit-growing in this district as a specialty, that it will pay him well to look into the different methods of planting.

By Mr. Rosamond :

Q. What kind of soil was it ?

A. A sandy loam. After deducting the expenses of 1899-1902, there is left a net profit of $485.53 for the four years, or an average of $121.38 per acre, beginning three years after planting ; but even deducting the cost of planting, price of trees and care of orchard from 1896 to 1899, there would still be a net profit of $335.53 from 1896 to 1902.

By Mr. Smith (Wentworth) :

Q. That seems a very large expense per acre ; can you give us any details ?

A. Yes, I will give you the details. The expenses have been made up on a very liberal basis, but the revenue was so large that I wanted to put in all the expenses possible, so that there would be no question about the balance, and I think you will agree with me, that these expenses are very liberal.

By Mr. Robinson (Elgin) :

Q. Where do you find a market for the Wealthy apple ?

A. At the Ottawa Fruit Exchange, and last year we shipped a number of cases to Glasgow, and we got very good prices indeed for them.

Q. Did you ship them in boxes ?

A. Yes, in boxes.

Q. You shipped them yourself ?

A. Yes, and they were packed in boxes.

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MR. ROSS (Victoria) : All the apples from Tasmania and Australia, come in boxes, there are about 60 pounds in the box.

COST PER ACRE PRODUCE OF RAISING AND MARKETING APPLES.

THE WITNESS.—The estimated expenses per acre from 1899 to 1901, including the rent of land, fertilizers, spraying and marketing, were $148.80. I have not the details here for those three years, it would be impossible to go into all the details for the three years, but the expenses for rent of land, fertilizers, cultivating, spraying and marketing were $148.80, that is an average of about $50 per acre. I have the details of the expenses for 1902, when there was a large crop.

By Mr. Smith (Wentworth):

Q. I understood you that the expenses before were $450 ?

A. The $148.80 was only a part of the expenses, which I have summarized because it would be impossible to put in all the expenses for these three years. They average about $50 a year for three years for the purposes named.

By Mr. Kidd :

Q. What class of fertilizer did you use ?

A. We used for the first three years a little artificial fertilizer, and then in 1902, there were 45 tons per acre of barn-yard manure used, which at 50 cents per ton came to $22.50. Then for 1902, the rent of land per acre $3, for cultivating and spraying the same year $14.43 per acre, for baskets and boxes we paid $120.12, and for picking, packing and marketing, $145.77, making the total expenses to $454.62 from 1899 to 1902, a good deal more expensive than perhaps you can do it for, Mr. Smith, but our expenses for labour are pretty high, because it is all done by men. We have no boys or girls.

By Mr. Smith (Wentworth):

Q. Of course one of the large items is always the packages and picking and packing.

A. These two large items, baskets and boxes, $120.12, and picking, packing and marketing, $145.77, make up a large part of the $454.62. If the $150 covering all expenses for the first three years, be taken from the profits there is still $335.53 net profit for the four years or an average yearly net profit of $83.88 per acre, beginning three years after planting, or from the time of planting an average yearly net profit of $47.93. These are very large returns indeed, and I propose to carry on this work with several other varieties. There are four or five that I might mention, such as the Milwaukee, which is an early bearing winter apple, which will begin to fruit almost as early as the Wealthy, and fruits very regularly and I believe can be grown for a limited number of years in large numbers on an acre of land, gradually thinning them out, and if necessary chopping out the whole orchard, and have other plantations coming on. These Wealthy apple trees were planted in 1896. This is an off year for the Wealthy trees as there was a heavy crop last year, but we hope to take off a large Wealthy crop next year, and then thin out the whole plantation enough to let light come in on all the branches, so that the buds will continue to develop properly.

By Mr. Robinson (Elgin):

Q. The Wealthy then, bears every other year ?

A. Some trees bear every year, but most of the trees every other year.

Q. I have one Wealthy tree and that bears every other year ?

A. That shows the advantage of having these records I was speaking about. We have about 140 trees under that test. A few of them have died. I have put down here

the averages of 17 of them for four years, and to show you how these trees vary in the way they produce fruit I might mention one of the most regular bearers that is, No. 4, in 1899, it bore nine gallons, in 1900, 2 gallons, 1901, 15 gallons, and in 1902, 20 gallons.

Q. That is the Wealthy, is it ?

A. Yes. So you see that is a regular bearer every year. Then, another we have, yielded 1 gallon in 1899, 12 gallons in 1900, none in 1901, and 30 gallons in 1902. That is a tree that bore every other year and I might give returns from other trees that varied in productiveness.

By Mr. Erb :

Q. Do you find that some trees have a heavy crop one year and none the next ?

A. Yes, especially those which bear very heavily one year, because the tree is weakened, and for that reason cannot very well produce a crop of fruit buds for the next year.

Q. You said a while ago that you strike this average for the five years, do you think that a very fair way of taking an average ? Supposing a tree bore one year and did not bear the next, in the five years it will have two good crops and three bad years, while another tree that bears this year will have three good crops in the five years, and therefore, at the end of five years in striking the average you are not in a position to say which is the best.

A. I should not perhaps have laid stress on taking the average for five years, but I was appointed Horticulturist in 1898, and began keeping the records that year, and as it is five years since my appointment, the average has been taken for that period. I intend to take the average every year if necessary, and next year it will be for six years, and the next year for seven years and so on. Now, I think that for fruit-growers who are making a specialty of growing fruit, (I do not think the general farmer could look after trees planted in this way), but for the men who are making fruit growing their principal business, and intend making their living by it, I think it is well worth while to look into this question especially for this district. Very often fruit-growers get discouraged when they put out their trees thirty feet apart, which is a good distance for the average farmer to plant, before they begin to get profitable crops of fruit, and the result is that very often their trees are neglected. Now, it seems to me that if paying crops of fruit can be obtained within a few years after planting more will go into fruit-growing, and I think there will be more profit out of it. But I wish to distinctly state that I do not recommend this close planting for the general farmer, as he is not likely to look after so many trees and thin and prune them at the proper time and the whole thing might prove a failure.

PLANTING DISTANCES BETWEEN FRUIT TREES.

By Mr. Smith (Wentworth):

Q. Is it not a great mistake that the instructions have always been given to plant apple trees 30 feet apart regardless of the variety ?

A. Yes.

Q. There should be no stated distances apart for apples to be set, each variety has its different spaces that should be allotted to it ?

A. Yes, that is very true.

Q. You might say, for example, that the Spy could be planted 10 feet apart, but other varieties would be crowding each other planted so close, and thus give the best distance for each variety ?

A. That is very true, but you know how hard it is to convey information to men who do not take very much interest in the subject. One has to give general instructions, which, if followed, will give good, if not the most economical returns ; for, if close planting for some varieties were recommended generally, the likelihood is, that all varieties would be planted close in most cases.

Q. You might muddle him ?

A. It might muddle him. If you give instructions to set trees 30 feet apart, there is no fear of crowding ; but if you were to say that a man should plant certain varieties at one distance apart and other varieties at another distance, I do not think your instructions would, as a rule, be very well carried out.

Q. What I have been recommending is to plant the Spy at a standard distance, and then plant these others, the Ben Davis or Wealthy, in between, cutting out these when they begin to injure the Spies.

A. That is, I think, a better system for fruit-growers generally than the one I have mentioned with regard to the Wealthy trees, as they would have the profits from these early bearing varieties, and then be able to cut them out and still have the more permanent kinds left. That is a system I strongly recommend myself; but this morning I was giving an account of this experiment with Wealthies planted close, and have suggested that for fruit specialists this system might be worth trying, especially in Eastern Ontario and the province of Quebec.

By Mr. Robinson (Elgin) :

Q. What distance apart are your Wealthies ?

A. Ten feet by 10 feet.

Q. Is your land clean ?

A. Yes.

Q. No crop on it ?

A. No.

By Mr. Wilson :

Q. Have you experimented with growing apples in heavy clay ?

A. No, we have none of that in the orchard at the farm ; it is all sandy loam soil. I believe we can get large crops indeed from this method—we have got large crops—and there are several varieties which can be grown in this way. These are : Milwaukee, Patten's Greening, Duchess, Wealthy, and perhaps one or two others. But these are only for this district ; I would not recommend this plan for other places further west, as I do not know that it would succeed as well there. I think that Milwaukee could give as good results as Wealthy. I believe with Mr. Smith, that the best plan for the average fruit-grower is to plant his permanent varieties from 30 to 36 feet apart, and interplant them with early-bearing trees, like the Milwaukee and Wagner, and when he cuts these out, he will have his permanent trees left.

By Mr. Robinson (Elgin) :

Q. How would it do to put peaches in between ?

A. I think it would be just as well.

Q. Except that you cannot grow peaches in every section.

A. With that exception, of course, that peaches will not grow in every section. Do you find any objection, Mr. Smith, to growing peaches among apples ?

By Mr. Smith (Wentworth) :

Q. We do not always have the soil that is suitable for peaches.

A. There is no objection, that I know of, to growing peaches in between. Plums would also do well.

By Mr. Robinson (Elgin) :

Q. You speak of pollenizing ; have you any way of doing it artificially ?

A. We can do it by hand. When crossing varieties we do it by hand and a bag is then put over the flowers to keep insects away until the fruit has set.

Q. Do farmers generally know how to do that?

A. No. In this Bulletin on apple culture which was prepared by me two years ago full instructions are given for cross-breeding.

Q. Have you given us all your statement in regard to the close-planted Wealthy apple orchard?

A. I may as well read this to the Committee in full, as it appears in my Annual Report :—

In the spring of 1896, there were in the farm nursery 144 five-year old Wealthy apple trees which had been used in an experiment. As there was a piece of land available that spring they were planted out 10 by 10 feet apart, the object being to carry on further experiments with them. Eight of these trees have died, but most of the rest are making thrifty growth, though some of the trees are affected with canker and sun-scaled. The soil has been kept thoroughly cultivated during the growing season every year since. During the past four years this little orchard has given very good returns, considering the size of the trees, and it promises to be still more profitable. It is doubtful if the trees will need much thinning, as a few of them die every year, letting the light and air into the rest. The soil is a cold, light sandy loam and from 1896 up to the autumn of 1901 the only fertilizers applied were 284 pounds of superphosphate, 54 pounds of muriate of potash, and 132 pounds of sulphate of ammonia, the estimated value of which was $6.64.

TABLE SHOWING RECEIPTS AND EXPENSES.

In the following tables will be found the receipts and expenses for the past four years :—

	$ cts.	$ cts
		Per acre.
1899—Picked, 189 gallons sold at 10c. a gallon	18 90	59 15
1900 " 455 " 10c. "	45 50	142 39
1901 " 156 " 15c. "	23 40	73 23
1902 " 982 gallons sold { 333 galls. at 25 3/4 c. (Glasgow)	85 41	356 83
{ 530 galls. (second grade) sold at Ottawa 6 15/100 c.	32 55	
1899—Windfalls, 66 gallons sold at 5c. a gallon	3 30	10 33
1900 " 143 " 5c. "	7 15	22 38
1901 " 224 " 5c. "	11 20	35 05
1902 " 932 1/2 " 8 37/75 c. a gallon	79 60	240 79
	307 01	940 15

APPENDIX No. 2

EXPENSES.

1899-1901, estimated expenses per acre for three years, including rent of land, fertilizers, cultivating, spraying and marketing	$148 80
1902, 45 tons per acre barn-yard manure at 50 cents per ton	22 50
Rent of land per acre	3 00
Cultivating and spraying per acre	14 43
Baskets and boxes	120 12
Picking, packing and marketing	145 77
Total expenses	$454 62
Total receipts per acre for 4 years	$940 15
Total expenses per acre for 4 years	454 62
Net receipts	$485 53
Average profits per acre per year	$121 38

There were 512½ gallons of small apples which were not sold, of which 119 gallons were among the picked fruit and 393½ gallons among the windfalls.

The reason that there is such a large proportion of windfalls is that the Wealthy apple drops badly, and this was especially the case this year. The windfalls, however, which were sold brought a better price than the second grade picked apples, and as good prices as picked fruit from other Wealthy trees. There is a great advantage in having a good local market, as the windfalls can be disposed of before they decay. The expenses are all estimated on a very liberal basis. The greatest yield of picked fruit from one tree, in 1902, was 16½ gallons, and the greatest yield of windfalls and picked fruit was 34 gallons from the same tree.

It has not been possible to obtain the exact cost of this orchard prior to 1899, but including rent of land, cost of trees, planting and cultivating, the expenses per acre would be about $150.

When such good returns can be had in a short time from Wealthy apple trees planted 10 feet apart, it is worthy of consideration. Is it not possible that it would be a good practice to have blocks of such early bearing trees of different ages and keep rooting out the older one when they begin to fail ? The development of this little orchard of Wealthy apple trees will be watched with much interest.

IMPROVEMENT OF NATIVE AND AMERICAN PLUMS.

There is not time to go into a full discussion of the merits of the improved native and American plums, but these plums are proving such a boon to the people who live in those parts of Canada where the European plums will not succeed, that I should like to say a little about them. There is an immense tract of country, north of latitude 45 in Ontario, throughout the greater part of Quebec, in Northern New Brunswick, and in Manitoba and the North-west Territories, where the European plums will not succeed owing principally to the fact that the flower buds or flowers are injured by frost. The native and American plums are much hardier, both in wood and in flower buds, and hence can be grown over a much wider area. It is only about fifty years since the wild plums began to be improved. The best seedlings which were noticed growing in the wood or along the road sides, were planted or grafted in gardens and orchards, and from these again other and better seedlings were raised. As a result, the size of the fruit has been very much increased, and the flavour and colour much improved. Already over 200 kinds of

American plums have been named, and more are being put on the market every year. It is true that many of these are not of very great merit, but the number of varieties is an indication of the great interest that is being taken in these plums and the value of them where the European plums will not succeed. There are two species from which have been derived most of the varieties which are useful in Canada, namely, *Prunus nigra,* the native plum of Canada, and *Prunus Americana,* which is a native of the United States. The former species has not been improved as much as the latter, indeed there are as yet few named varieties of it, but it has some advantages over the Americana plums, and it is hoped that further improvements will be made on it. Experiments are now being carried on at the farm with this end in view. One advantage the Nigra has over the Americana is, that it is a much stronger tree and will not break down as easily. The Americanas, being of more spreading habit, sometimes suffer considerably in winter or when loaded with fruit, the branches breaking down, and often the tree splitting down the trunk. A large proportion of the Nigra plums are early varieties, and some of them extra early. This is a great advantage, when plums are desired that will ripen where the season is short. The named varieties of the Nigra plum are not as good in quality as some of the Americanas, but there are unnamed seedlings which are almost, if not quite, as good, and it is probable that when the Nigra plum has been improved as much as the Americana, there will be named varieties of very good quality. The native plums are also, as a rule, thinner in the skin than the Americanas. In a bulletin on Plum Culture, which is now in press and will be issued shortly, I have described the best of the named varieties of both Nigra and Americana plums and have gone rather fully also into the methods of cultivation, spraying, &c. The European and Japanese plums are also described in this bulletin. District lists are also given, in which are placed the names of varieties considered most suitable to the various fruit districts in the provinces of Ontario and Quebec. These should be of great assistance to the fruit-grower in helping him choose the best varieties.

POTATOES.—SPRAYING, CULTIVATION, CROP RETURNS AND QUALITIES.

I would like to bring before you the experiments we have been carrying on in treating potatoes to prevent blight. This I think is one of the most important experiments we have been carrying on, though the value of spraying with Bordeaux mixture to prevent blight and rot has been known for some years. To get good results, however, the mixture has to be thoroughly applied and the vines kept covered with it. As showing the importance of this matter I may say that the average potato crop in the province of Ontario last year was 89 bushels to the acre, a very small crop indeed. This was due largely to the potato blight and rot.

By Mr. Ross (Victoria):

Q. What do you call a good crop of potatoes ?

A. From 250 to 300 bushels to the acre is what I would call a good crop for field culture. There are several other reasons, however, for the smallness of the Ontario potato crop. One is that the farmers do not always have the best variety. For instance last year we found that there was a variation of over 500 bushels to the acre between the best and the poorest varieties grown on our farm.

By Mr. Robinson (Elgin):

Q. What was your best yielding potato ?

A. Last year it was the old Peachblow.

Q. The old Peachblow ?

A. But for an average of years the Peachblow does not do as well as some other kinds.

Q. How many bushels did you get last year from it ?

APPENDIX No. 2

A. At the rate of 690 bushels 48 pounds of marketable potatoes to the acre, the biggest crop we ever had at the farm. This of course was the yield from a small plot; it would not be that for field culture. The variety which gave the poorest yield was the Houlton Rose, which gave us 123 bushels 12 pounds to the acre. That gives a difference of 567 bushels between the best and the poorest varieties, so you can easily imagine, if a farmer had been growing potatoes for a long time without change, he might have a variety giving him 150 bushels less to the acre than if he got a better cropping variety. There are several other reasons why the crop is small. There is the variety used and then the kind of seed planted. Very often farmers are a little short of seed and cut their potatoes small. Now, in a dry season like this was, I think the results from that method will be very poor. The small pieces probably dried up from the want of moisture and the heat and the field will be patchy and the crop small.

Q. How do you do ?

A. We use the best potatoes and cut them in pieces so as to have a good amount of flesh and we make sure of having at least three eyes in each piece.

Q. Do you cut the seed in half ?

A. No, we cut them from end to end and then across. We find it makes so little difference what part of the potato we use, that we use it all, but we always have three eyes to each piece.

By Mr. Chairman :

Q. Is there any advantage in using medium sized potatoes in selecting them for seed ?

A. Yes, we always use medium sized potatoes. The results will be better in the long run than by using small potatoes.

By Mr. Stewart :

Q. We use medium sized potatoes in Manitoba and do not cut them. We found when they were cut the ground took all the life out of the potato and it died.

A. That is confirmed by the experiment we have been carrying on this year. We had some at the farm do that even with our liberal cutting, which is more than the average farmer gives. We use 24 bushels or more to the acre where the average farmer will not use over 8 or 10 bushels. But this year, even with our liberal cutting, some of the seed died and I can quite imagine that out west, in a district which is often subject to dry weather, it would be advisable to plant them whole.

By Mr. Robinson (Elgin):

Q. And in wet weather it will be better because if cut they are more apt to rot.

A. Yes, they would be more apt to rot. We plant our seed from four to five inches deep.

By Mr. Stewart :

Q. That is too deep for us; an inch and a half to two inches is enough.

A. Indeed.

Q. That gives the best results with us.

A. We have tried experiments at the farm with potatoes planted at different depths, all the way from one inch to eight inches, and I have carried that on for six years, including this.

By Mr. Robinson (Elgin):

Q. Which depth do you find best ?

A. Every year up to this one we found that those planted at a depth of one inch in sandy loam soil gave the best results, but the reason we cannot recommend that depth is that for field culture, where the field should be harrowed for weeds, the potatoes

would be pulled out if they were planted so shallow, so it is necessary to put them down four inches for field culture. The difference is quite a little but the labour in keeping the field clear of weeds, if one cannot use the harrow, is very great.

By Mr. Stewart :

Q. The system I adopt is to put them in drills like turnips and then run a harrow over your field. Then you have a level culture and you have no sun-scald. Your land looks the same as if you were preparing it for turnips. You run the rows east and west and leave a large trench for the potatoes.

A. That is a very good plan. It would be well worth trying in this district. According to the plan you describe your potatoes would be planted more than 1-inch deep after you got through ?

Q. Probably 6 inches.

A. Oh well, that is very like the depth of ours here, which are from 4 to 5 inches deep.

Q. But at the start we plant them 1 inch deep.

A. That is a very good plan. Another reason why the potato crop in Ontario is small is that there is a lack of thorough cultivation. It is quite a common thing to go through the province in the latter part of August and not to know there are potatoes in the fields at all, they are so weedy. If the field was thoroughly harrowed just as the potatoes were coming up, and well cultivated afterwards, the crops would be much better, and the weeds would be killed. When weeds are allowed to grow in fields like that, they take a large amount of food from the soil, to the detriment of the growing crop. Another enemy of the potato crop in Ontario is the potato beetle ; but, as a rule, the farmer will spray his potatoes and kill them.

POTATO BLIGHT,—FORMULA FOR PREVENTIVE.

I wish to speak particularly of blight, in dealing with these potato experiments. The blight, apparently, comes in a single night and destroys a whole field of tops. The potato ceases growing, and the result is, that one gets a small crop or none at all. The importance of keeping the tops growing was shown in an experiment which was conducted in Vermont. By digging their potatoes on September 1, they got 234 bushels to the acre of marketable potatoes, and by keeping them growing until September 22 they got 353 bushels to the acre. This was a difference of 119 bushels to the acre, which was obtained simply by letting the tops grow for 22 days longer. We averaged at the farm, by spraying ours with Bordeaux mixture and keeping the vines growing eighteen days longer, 120 bushels more to the acre than when the vines were unsprayed. Some varieties were kept growing much longer, but we averaged that. We tested 11 varieties, the average yield from which was taken. There were sprayed with Bordeaux mixture on July 10, July 22, July 30, and August 13. The mixture used was 6 pounds of bluestone, 4 pounds of lime and 40 gallons of water. In the experiment there were used, per acre, 114 pounds of bluestone at 7 cents per pound, which cost us $7.93, the mixture being put on at each spraying at the rate of 190 gallons per acre. That is a large amount and more than would be used in field culture. These were in plots, one-thirty-sixth of an acre. In these tests the average date that the plants died, where unsprayed was September 7 ; that was with 11 varieties. Where sprayed with the Bordeaux mixture, the average date the plants died was September 25, a gain of eighteen days by spraying ; and, as I said before, in that experiment in Vermont it was found that there was a gain of 119 bushels by keeping the potatoes growing twenty-two days longer, so that our results confirmed the others.

By Mr. Robinson (Elgin) :

Q. You kept them growing by spraying ?

A. Yes. Now, the average yield for the 11 sprayed varieties was 310 bushels 12

pounds per acre of marketable potatoes, and from the unsprayed of the same 11 varieties the yield was only 189 bushels 54 pounds per acre, a clear gain of 120 bushels 18 pounds per acre. These were grown right alongside, and there were a great many visitors who saw them there, the same varieties, sprayed and unsprayed. The unsprayed vines died down quite early and got perfectly dead, and the others were quite green for a much longer time. The difference of 120 bushels per acre, at 40 cents per bushel, came to $48 per acre, and the cost of material used was nearly $7.98, a net gain of $40.02 by spraying. Of course, there was the labour in addition to that, but there was a great gain by using the Bordeaux mixture.

By Mr. Richardson :

Q. What is the nature of this blight ?

A. It is a disease which is carried over in the potato tubes during the winter in the form of dry rot. This is not a wet rot, such as is supposed by some, but it goes through the winter in the form of a dry rot, and in the spring, when the potatoes are planted and begin to grow, this disease begins to spread, and grows up through the potato stalks, and permeates throughout the whole plant, and usually between the middle and end of July or early in August, the disease comes to the surface, underneath the foliage, and here are developed myriads of spores, and these spores are carried by the wind all over the plantation, and, alighting on the foliage, they infest the plants all over the field, and the spread of the disease is so rapid that, as any of you who grow potatoes know, you may go out one day and see a good field of potato tops, and perhaps twenty-four hours after, or even less, the crop will be almost ruined.

Q. So that it is practically both an external and internal disease ?

A. Yes. And with regard to these spores, the theory is, that some of them fall to the ground, and penetrate the soil, and get into the tuber in that way. They develop on the under side of the foliage, when the tubers are forming or when the crop of marketable potatoes is still comparatively small. By spraying with the Bordeaux mixture, beginning before this disease appears on the leaves, and keeping the foliage covered with the mixture all through the growing season, from a period a little before the disease is expected until, say, the end of August or early in September, the result is, that when the spores appear, the Bordeaux mixture kills them. The action of the bluestone on the spore will kill it, and the result is, that the spores do not spread, and the crop is safe.

By Mr. Robinson (Elgin) :

Q. What is the cost of the bluestone ?

A. It was 7 cents per pound last year. I do not know what it is this year ; I think it is about the same.

Q. It is really vitriol.

A. Yes, blue vitriol, sulphate of copper.

By Mr. Ross (Victoria) :

Q. What is the formula ?

A. It is 6 pounds of bluestone, 4 pounds of lime, and 40 gallons of water. This spraying of potatoes is not a new subject by any means, but I wanted to bring before you the results we had at the farm, so that they may be printed and sent broadcast, in order that they may be brought before the farmers, because there are crops of potatoes that are ruined every year by this disease, when they could just as well be saved. Dr. Fletcher, in 1894, published a bulletin on the blight and rot of potatoes. He has made a special study of this disease, and has carried on experiments to prevent it. Both in 1901 and 1902 we obtained very marked results indeed, the increase by using the mixture in 1902 being 120 bushels per acre, as I have already stated.

By Mr. Robinson (Elgin) :

Q. What kind of apparatus have you for spraying ; is it a horse-pump ?

A. We have a pump and barrel attachment, which are put in a cart which runs between the rows.

By Mr. Smith (Wentworth) :

Q. Do you recommend spraying every year, or is there some indication of the disease ?

A. There is no indication long enough beforehand to be of any value. One has to do it every year, and that is what discourages the farmers from spraying their potato vines. We find the same difficulty in getting fruit-growers to spray regularly for the apple scab. Some years there is little scab and little blight, and then spraying is cried down, even by farmers and fruit-growers, because they say that there is no need of it, and it is not of any value. For instance, a farmer goes to the expense this year of keeping his vines covered with the spray, and there is no blight, and his neighbour, who does not spray, has as good a crop as he. He decides to abandon spraying, and the result is, that next year he does not spray, but the blight does come, and his crop is more or less a failure.

By Mr. Robinson (Elgin) :

Q. Some years, the man who does not spray will have as good a crop as the man who does ?

A. Yes, but where spraying has been carried on for ten years or more, it has been found that it pays well to spray every year.

By Mr. Stewart :

Q. We have some experiments with wheat in Manitoba. Some years we have smut, and some others we do not ; but it is advisable to use bluestone or formalin every year. You may sow smutty wheat one year and have good wheat from it.

A. Yes.

By Mr. Smith (Wentworth):

Q. It is the same with curled leaf on peaches. Those who sprayed this year have still some of it this year, but those who sprayed last year and this year as well, have none.

A. That is very interesting. There is no doubt the man who sprays constantly and thoroughly is the man who will come out well in the end. That has been the experience all over but it is very difficult to get farmers and fruit-growers to do that. It is surprising how small a proportion of farmers and fruit-growers will spray constantly and thoroughly. It is a dirty and rather expensive process and if there is any excuse for not spraying one is tempted to take it.

By Mr. Erb :

Q. Do you spray all your potatoes or only those that are used for experiment ?

A. I have charge only of the experiments and those we sprayed thoroughly with the Bordeaux mixture. There is about an acre under my charge.

By Mr. Smith (Wentworth):

Q. About what size are the potatoes when you first start spraying ?

A. We sprayed last year on the 10th of July. They would probably be about one foot high, but the idea is to spray in time to avoid any possibility of the disease beginning to spread before spraying is begun because once the spores spread and perforate the foliage it is almost impossible to check it, so the plan is to spray early and we

sprayed on July 10, because that is the date we sprayed for the potato beetle, the Paris green was put with the Bordeaux mixture.

By Mr. Maclennan :

Q. In your judgment has this mixture much influence on this beetle ?

A. I do not think it has much influence on the potato beetle but it has on the flea beetle. This is a little insect, a little black, hopping insect that does a great deal of injury to turnips sometimes. It punctures the leaves all over. It has been found that these punctures lessen the crop a great deal and also give a better opportunity for what is called the early blight to get on the foliage and get a start and by keeping the foliage perfect, by having this covering on these flea beetles are kept off and that helps the crops a great deal.

By Mr. Erb :

Q. Do you know whether the large crops on the farm are sprayed or not ?

A. I do not think they were sprayed last year with Bordeaux mixture.

Q. How do their returns compare with yours ?

A. They are very much less; but there is never as large a yield from field crops as from small plots.

Q. Your plots were all sprayed ?

A. All sprayed.

Q. How can you tell whether the crops sprayed were or were not better ?

A. There was one plot sprayed and another unsprayed alongside of the same varieties. You see we planted the varieties in rows, eleven varieties in rows and a line was run through the rows crosswise and stakes put down dividing the plots, and one plot was sprayed and another unsprayed. There were a great many visitors who saw the plots and one could readily see where the vines had not been sprayed with Bordeaux mixture, as the plants were dying or dead while in the sprayed plots the foliage was still green.

By Mr. Stewart :

Q. Have you any report of potato blight in Manitoba and the Territories ?

A. I have never heard of any in Manitoba.

Q. I never saw any.

A. No, I never heard of any. These plots were one-thirty-sixth of an acre each. There were three tests. I was also carrying on experiments with an insecticide and fungicide called 'Bug Death' in addition to the Paris green and Bordeaux mixture and the plots were divided into three plots of a thirty-sixth of an acre each. Our experience at the farm coincides with the experience of large growers who spray their potatoes thoroughly every year.

By Mr. Erb :

Q. If potatoes that were affected last year are used for seed this year will they be certain to have blight ?

A. No, they would not be certain to have it as a great deal depends on the weather conditions; but they would be more likely to have it than potatoes grown from healthy seed.

By Mr. Smith (Wentworth):

Q. I suppose when spraying for blight you put the Paris green in and kill the bugs at the same time ?

A. It is not necessary to use Bordeaux mixture as we did the first time, on July 10, because that is early in this district. Where the season is early, the blight is early, but we do not usually get the blight until from the third week in July to the first week

in August ; but we wished to be perfectly certain of preventing the disease, and we sprayed first on July 10, and I believe it is far wiser for every farmer to spray when he starts to spray for potato beetle.

Q. Does this blight come on at a certain period of the year, or at a certain stage of the growth of the potato ?

A. Usually a little after flowering time.

Q. That would depend altogether on the time the potatoes are planted ?

A. Yes, a great deal depends on that ; but the spores of the fungus seem to develop at a certain period in the growth of potatoes.

Q. Then, you could not set any date for spraying ?

A. No, but our experience has been that the blight usually appears between July 15 and the end of July.

By Mr. Robinson (Elgin):

Q. You are thoroughly convinced that spraying has been useful ?

A. Oh, yes.

Q. Then, what is the benefit of leaving some unsprayed ?

A. The simple demonstration of these plots, last year, to farmers who came with the excursions, would convince a farmer far quicker than anything one could tell him that he did not actually see.

Q. If it was for an object lesson, perhaps there was some value in it.

A. Oh, yes.

By Mr. Erb :

Q. Is this blight as likely to appear in a dry as in a wet season ?

A. No.

Q. The weather has something to do with it ?

A. A great deal to do with it. In close weather you will often find the disease spread very rapidly. It seems to spread more rapidly in close, muggy weather than it does with bright atmosphere.

On the conclusion of his evidence, the witness displayed to the members of the Committee photographs of close-planted Wealthy apple trees, to show the rapidity of growth, and also a small shield of tar paper, used in connection with experiments in the prevention of a small fly that attacks young cauliflowers.

Having read over the preceding transcript of my evidence, I find the same to be correct.

W. T. MACOUN,

Horticulturist, Central Experimental Farm.

THE FARM POULTRY YARD

HOUSE OF COMMONS,
COMMITTEE ROOM 34,
FRIDAY, June 26, 1903.

The Select Standing Committee on Agriculture and Colonization met here, this day, at 10 o'clock a.m., Mr. DOUGLAS, Chairman, presiding.

Mr. A. G. GILBERT, Poultry Manager, Central Experimental Farm, was present, at the request of the Committee, and was examined as follows:—

MR. CHAIRMAN AND GENTLEMEN OF THE COMMITTEE,—It is one of the pleasures I have, in my work, to appear before you once a year and give an account of such work in connection with my Division of our experimental farm, as is of interest to you and of value to the farmers of the country. With this object in view, I submit to you, for your consideration, and as briefly as possible, the facts in connection with my work and the lines along which it is being carried out at the farm here.

The kind of instruction in poultry keeping which its rapid development calls for and which the experience of many years has shown is required by, and is best calculated to be of practical benefit to our farmers.

The favourable situation of the farmer in regard to successful poultry keeping, particularly at this time, when poultry keeping is increasing to such a great extent in the country.

The adoption of modern methods, such as artificial hatching of chickens by incubators and rearing them in brooders, as aids to the farmer.

Are the farmers adopting these methods ? And some proofs that they are, from farmers themselves ?

Egg-production and flesh-forming by different standard breeds or their varieties in three years.

And lastly, if time permits, I would like to give you some results of the experimental work of the past year.

EVIDENCE OF PROGRESS IN THE METHODS OF POULTRY RAISING.

In connection with the claim advanced for proper or up-to-date instruction of the farmer in poultry breeding and management, on the ground of the rapid progress the industry is making, the question is frequently asked : Are farmers really taking greater interest in their poultry, and are they adopting improved methods ? This question is frequently asked me. To this I give the following unhesitating reply :— That poultry keeping is now a progressive and recognized branch of farm work, as is proved :

1. By the great and ever-increasing demand from the farming community for instruction as to the best and most money-making broods or varieties of breeds of fowls, and their proper management ; and this notwithstanding the vast amount of

information that has been, for the past fifteen years, so liberally given from our experimental farm poultry department : by pen, in the shape of reports, pamphlets, bulletins, and articles in papers, and by voice at farmers' institutes and special meetings, extending from Prince Edward Island on one side of the Dominion to British Columbia on the other.

Secondly, by the very great increase in the production of eggs in winter and the superior quality of poultry flesh for sale in our local markets, or for export to the English cities ; and all this by farmers.

Thirdly, in the face of this great increase in quantity and quality, a steadily advancing price for the better quality. Proof of this may be had in the statements made by farmers themselves as to prices obtained from Montreal merchants, which will be submitted to you by me, in due place.

Fourthly, by the several sources, other than our experimental farm system, from time to time established to give information to farmers on poultry breeding and keeping, on the ground of the money-making value and rapid development of the poultry interests.

The foregoing I submit to you as strong proofs of the increasing interest that is being taken in this important branch of farm work.

NATURE OF THE INSTRUCTION REQUIRED.

As to the nature of the instruction to be given, the experience begotten by poultry culture and experimental work of twenty years, by attendance at the many meetings referred to, and by personal intercourse with numerous farmers, leads to the conclusion that it must be :

Plain and practical,
Easy to put into profitable operation,
Inexpensive,
And showing a thorough knowledge of farm conditions in the different parts of the Dominion.

Poultry keeping, it must ever be remembered, is only one part of the farm work, and farmers can only devote a certain amount of time to it. It should certainly be the aim to make every department of the farm pay. The up-to-date farmer, as a rule, as is well known to you, is a level-headed man, and by keeping track of his expenses will quickly find which department or departments of his work pay him best. Should he find, after reasonable experience, that his success in poultry keeping warrants him becoming a specialist in its prosecution, perhaps in conjunction with small fruits and orchard work, that is a matter for his consideration. Doubtless, in the agricultural world, as well as in the great world of commerce, one man will find himself better adapted to certain lines than others, and it is also to be remembered that all farmers have not the same facilities for obtaining high prices. Some farmers are further away from good markets or favourable shipping points than others. Instruction must be of such a nature as to be suitable to all the varying conditions. Mr. A. S. McBean, of Lancaster, Ontario, is an example of the profitable combination of market garden, fruits and poultry.

In giving instruction, it is to be remembered that in order to make the highest profits out of his poultry, the farmer must set about getting them in the right way. He should be told to have new-laid eggs in winter and rapid flesh-making chickens in summer. It is only business-like to make money at both seasons of the year and to put your product on the market when it is worth most. It is very evident that the farmer who makes money in only one season of the year, and not in both, is only getting half value out of his fowls. A skilled dairyman would not so manage his cows as to have them giving milk only in summer and not in winter. Experimental work for

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many years has shown unmistakably that, when properly managed, the following fowls will make money for the farmer at both seasons of the year :—

Barred Plymouth Rocks,
White Wyandottes,
Buff Orpingtons,
Silver Grey Dorkings.

These varieties have been found good winter layers and rapid flesh-makers.

The Buff Orpingtons are a comparatively new variety, but are a most promising utility fowl and have already taken a front place. When better known, they will undoubtedly be a popular variety with the farmers. It is simply a matter of merit : if they have the necessary qualifications of winter layers and quick growers of acceptable type, they will hold their own. If not, they will soon go out of favour. The Dorkings are a well-known English breed of great merit. They are perhaps one of the oldest and best-known English breeds. The Silver Grey variety, which is recommended, and which we have been trying recently, has proved a good winter layer with us. One of the objections made against them is, that they are tender and, as such, not hardy winter layers ; but such has not been found to be so by us. Admitting that the objection is warranted—which it is not—in the hands of skilled breeders any objectionable drawbacks should quickly be removed.

IMPORTANCE OF STRAIN.

Experience has also shown that some strains are much better egg-layers than others, as some are much more robust and constitutionally stronger than others. As a result of a recent egg-laying competition among different breeds, held in England, the statement was made, at the conclusion of the test, that one of the most important lessons taught was the value of strain. It did seem as if strain was as important as breed, and undoubtedly such is correct. Too much importance cannot be placed on strain. The dairyman knows the value of that. To have good winter layers, early moulting hens and rapid growers, the progeny should come from parent stock which have proved themselves to have all these desirable points. Chickens from hens which have been kept in artificially warmed houses, and otherwise pampered to lay during the winter season, are not likely to make good winter layers, if they should be placed in the ordinary farm poultry-house. It is most important, then, that the farmer should know all about the stock from which he buys eggs for hatching, and it is equally important that the teacher should know and value that fact. It is from hardy, vigorous parent stock that the farmer should obtain eggs for hatching or young birds to breed from.

A PRACTICAL ILLUSTRATION.

In connection with this and as a proof of its correctness, the following experience in connection with the work in my department should be brought to your knowledge. The results are from Barred Plymouth Rock and Buff Orpington pullets, which, with the male bird, never knew what a warm house was. The Plymouth Rock pullets were hatched in May ; the Orpingtons in July, and unavoidably so, because we did not get the eggs for hatching them sooner. The egg-laying by the Plymouth Rock pullets was remarkably good. From the eight birds, during December, January and February of last winter—and we all know what a cold winter it was—four, five and six eggs were collected daily. The best laying was done in January and February. After a thirty-degree-below-zero drop in January, the number of eggs went down, for a day or two, to three per diem, but it soon went up to four or five again.

The house these birds were kept in was part of a shed and was made of two thicknesses of one-inch board, with paper between. It was not a warm place, as you will

readily understand, for the eggs had to be collected soon after being laid, or they would have become frozen. But the birds were out in the shed almost every day and came from parent stock which had been kept under similar conditions, for their parent stock never knew what a warm house was ; nor do they, for they are yet alive, and very much so. This, in combination with the fact that the birds were fed on the house and kitchen waste. They were fed on potato peelings, turnip peelings, bits of cabbage, carrots, and broken meat. These were all boiled and mixed into a stiff mash with a little shorts. Occasionally a little cornmeal is added. Raw cabbage, and a mangel now and again, were also often given. A dry dirt floor, not overmuch room, not very much exercise, but still the birds laid as I have told you. Why ? They were hardy, from hardy, vigorous parent stock, and the variety in their rations and the cold but pure fresh air did the rest. The variety in the rations did seem as important, if not more so, than the rations themselves.

The Buff Orpington pullets did not lay as early as the Barred Rocks, because they were late July hatched, but when they did begin to lay, between five and six months of age, no birds could lay better. They were kept in a division of the same cold poultry-house as were the Rock pullets. From these Orpington pullets, three, four and five eggs a day were got, and in early spring every one of the six pullets, several times, laid daily, during a week.

WINTER LAYING,—HEALTHY GERMS.

You may ask, were the germs strong after the fowls had been laying so well all the winter ? The following results will show :—

On March 18 (early), 13 Orpington and 3 Barred Plymouth Rock eggs were placed under a hen, and every egg hatched.

On March 11, 11 Buff Orpingtons and 2 Barred Plymouth Rock eggs were set in our farm poultry-house ; result, 10 chickens.

On the 21st of the same month, 13 Buff Orpington eggs were set ; result, 12 chickens.

On the same day, another lot of 13 Orpington eggs were set ; result, 11 chickens.

These chickens were placed outside, and in spite of cold winds, in the middle of April, made good progress.

The above results are important, as not only showing what can be done by strong, sturdy stock, but will effectually answer the question so often asked, 'Will eggs from hens which have laid well all winter, give good results ?' The fertility and strength of germs are surely remarkable, as showing what can be done by breeding from hardy, vigorous parent stock, made so by pure air, if cold, and variety in the composition of winter rations. It is from such stock the farmer should procure his eggs for hatching from, or his breeding stock. It is all important that he should begin right.

THE FARM IN RELATION TO SUCCESSFUL POULTRY KEEPING.

We now consider the situation of the farmer in regard to successful poultry keeping. Letters are frequently received from correspondents, saying : 'The writer has been engaged in the dry-goods, grocery or other business, and that in the prosecution of it he has lost his health. Being of the opinion that poultry keeping will be a means of livelihood and restoration to health, he desires to know the amount of capital, quantity of land, number of fowls, kind of buildings, &c., required in order to be successful.' It is evident that in such a case the enterprise would have to be conducted as a specialty, which would require expert knowledge and special facilities to successfully prosecute. Such expert knowledge can only be practically learned by serving an apprenticeship at one of the large poultry plants, of which there are only two or three in Canada, but many in the Eastern States of America, or he might eventually learn

by experience, which would be slow and expensive. Happily, the position of the farmer is entirely different. Poultry keeping is essentially in his line of business. As a rule, he has a certain number of fowls, and he has a general idea of their management. He has the grain, the roots, and other essentials in abundance. His stock in many cases may not be pure, nor his poultry-house of the latest or best design, but these he can quickly remedy, if he will, and, which is of very great importance, he has a certain knowledge of live-stock management. It has been forcibly impressed upon the farmer in our experimental farm reports, that in order to have the early chickens, it is necessary to have the strong germs of which we have been talking, which is generally the result of fowls coming out of winter in robust condition. Fresh air and exercise are means to this desirable end, and farmers have many opportunities of allowing their fowls to run in the shed, or barn, or poultry-house, during the winter season. The poultry-house with open-shed attachment, as shown in my report of last year, has been adopted with great success by many farmers as means of allowing the fresh air and exercise so desirable.

How many hens should a farmer keep, and how many chickens should he rear ?

This is a question of great import. From 50 to 100 hens should not overtax the resources or energy of the ordinary farmer, and he should be able to rear 150 chickens. It is not good for him under any circumstances to have more fowls than he can manage profitably. If there is help to be had from his family, a greater number may be successfully handled. It is fair to presume that the great bulk of the chickens raised throughout the country will come from the many farmers with a few hens, rather than from a few farmers with a large number of fowls each. In regard to this phase of the subject, the ground I have taken will be shown in the following report of an address delivered by me at a series of farmers' institute meetings held last winter in North Lanark, in company with Mr. Fixter, and which reads :—

'Mr. Gilbert, in introducing his subject, remarked on the number of boys and girls present. It was of the most vital importance to keep them on the farm, and poultry keeping, if taken up in the right spirit, could be made an attractive and remunerative means of doing so, and in this way : The poultry purchasing companies of Toronto were only too anxious at this season of the year'—that was about January —'to make arrangements with the farmers for the supplying of from 100 to 250 chickens each, to be ready in the months of July and August. This would necessitate the use of incubators and brooders (which are successfully operated by many farmers' wives), in order to have the chickens in quantity and uniform size. The women and young people of the farm household quickly learn to manage incubators and brooders. The rearing of the chicks requires to be carefully attended to, in order to have the so much called for three or four months' old bird. April is the best time for the farmer to set his hens, or fill his incubator, so that he may have early May chicks, which certainly, in this section, make the most satisfactory progress. But the farmer says, "I would like to get the chickens for the Toronto people, but I am a pretty busy man about the time the hatching and rearing should take place, and I am afraid I won't have time." Now is the opportunity to say to boy or girl, or both, "If you will hatch and rear the chickens the Toronto buyers want, I will give you a paying percentage of the profits." By so doing, the farmer will not only make money for himself and his family, but he may create a love for this department of farm work that may be a tie that will bind the boys and girls to the farm for good, and that is what we want to accomplish.'

In regard to this very important phase of the subject, you will perhaps kindly allow me to repeat what I have said in my annual report, recently published and laid before you. It is as follows :—

'Poultry keeping admittedly affords congenial and healthy employment for women. Many poultry plants of less or more magnitude are successfully conducted in this and the neighbouring country by wives and daughters of farmers and business men. In

England, several extensive poultry establishments are successfully managed by ladies of title and wealth. A phase of the subject which, perhaps, appeals to the farmer from a sentimental as well as practical stand-point is, that in creating a taste for poultry culture in his boys or girls, he may weave a tie that will permanently bind the young people to the farm. The caring for and properly feeding of 150 or 200 chickens certainly afford ample opportunity to the young or older people, for in no time of the chicken's life is proper care and feeding more required than during the first six weeks of its existence, and in too many instances that, unfortunately, is the period chicks are allowed to pick up their own living. It is hardly necessary to say, when chickens so cared for arrive at the market, they receive the lowest value. It is well to bear in mind that any extra care or attention given to the chick during the period mentioned will be amply repaid by quick development. On the other hand, neglect can hardly ever be repaired.'

The very great importance of keeping the boys and girls on the farm, and finding employment for them is not only recognized, I am sure, by your Committee, as representing the agricultural interests of the country, but we find that it is also appreciated by the press of the United States, as proved by the following extract from an article in a recent number of the New York *Independent*, a leader of thought and one of the best-edited magazines in that country. The extract reads as follows :—

'American farming life, before the Civil War, was a satisfactory pursuit, and rural homes were centres of an interesting social life in populous neighbourhoods, because the families were large. There were sturdy boys and girls to do the work, out of doors and indoors, without the necessity of resorting to a relatively worthless lot of ignorant farm hands, bringing an element of danger and demoraliaztion into the community.'

And allow me to add, that as a means to the desirable end of keeping more, at any rate, of our bright boys and girls on our farms, poultry keeping, among other new and money-making branches of farm work, by itself, or as has been said, in conjunction with apple and plum-growing, is recommended to the farmers of the country.

ARTIFICIAL HATCHING AND REARING.

We now consider our third and fourth points, as to modern methods, such as artificial hatching and rearing of chickens by incubator and brooder (as already referred to), and the question, 'Are farmers adopting such methods ?' From correspondence and conversation with farmers, manufacturers and agents, I am warranted in saying that thousands of farmers have within the past year adopted the more ready and convenient methods of artificial means to secure chickens of uniform age and in desirable number. Incubators and brooders are now made, and have been for some time made, so simple of construction, easy of operation and certain in results, that they are recommending themselves and being used to secure the results referred to. I have already shown that the purchasing companies want a late July or August chicken, which should weigh, with proper care and treatment, nearly three pounds each at end of three months, certainly four pounds in four months. I have also pointed out, in report for 1900, that the most suitable time for the great majority of farmers to hatch out their chickens is in April or early May, for the reason that, unless provided with incubator room and brooding house, so as to be independent of outside temperatures, it would be inconvenient, if not impossible, to raise chickens in paying numbers at an earlier season. Further experience and expressions of opinions from farmers strengthen that statement. Experience has also shown that pullets hatched prior to late April, or May, although they may begin to lay in late summer or early fall, are apt to moult and remain non-productive when eggs are at their highest value. On the other hand, the May pullet, which probably begins to lay in November, and continues to do so

without ceasing during the season of high prices, is obviously the most suitable bird for the farmer.

As to the best means of hatching and rearing the chickens, farmers and poultry breeders are fast realizing that in order to have the early chickens in requisite number and uniform age, artificial means are necessary. There is no intent to belittle the hen as a hatching medium. Doubtless, she will be the favourite with those who desire only a limited number of chickens and are not particular as to whether early or late hatched. But where over one hundred chickens are desired, early and at the same time, many more hens than are usually obtainable at that season would be required to give desired results.

The last answer to the query, 'Are the farmers adopting these methods and carrying out practical instructions from our farm reports,' is furnished by the farmers themselves in the following letters and statements which I have received from farm sources, and which I submit to you as not only proving my contention, but as likely to help on others to do likewise. The first I bring to your notice as showing the benefit of practical instruction and the large percentage of profit to be made out of well-managed poultry, is the following extract from a letter written by an energetic and enterprising young farmer, Mr. Alexander McPhadden, of Dominionville, Ont. It reads as follows :—

FARMERS WHO GIVE THEIR EXPERIENCE BY LETTERS.

'DEAR SIR,—I have been most successful in my poultry venture. Your instructions have been adopted and carried out. We sold our eggs, obtained in winter, to a Montreal dealer, at 40 and 45 cents per dozen, and our chickens at 10 cents per pound. I have kept a careful account of the different departments on the farm, and I have no hesitation in saying I receive more remunerative returns than the average farmer. But I have failed to get from them 100 per cent profit, much less 200 per cent, that I am getting from my poultry.'

Last year, I had the pleasure of reading to your Committee from a letter written by Mr. Wm. Moe, a farmer of South Franklin, Que., showing how, by selling eggs in winter and chickens in summer in Montreal, he had made a profit of $2 per fowl over and above expenses.

Mr. MACLAREN (*Huntingdon*).—I fancy Mr. McPhadden wishes to convey the meaning, that he makes twice as much out of his poultry, as compared with his profits from other departments of his farm. It is well to have that point made clear.

Mr. MCEWEN.—I do not think he means to convey any other impression than that he makes more out of his poultry than from other departments.

Mr. MACLAREN.—I can understand that.

The WITNESS.—Mr. McPhadden, I think, wishes to convey the impression, that he made twice as much out of his poultry as he did out of other branches. Another point is, that he keeps a strict account of the expenses in connection with the working of his different farm departments. The second letter I submit to you is written by Mr. R. S. Lovelace, of Ballymote, who writes under the date of January 2, 1903. I may say that these are only a few of a great many letters I receive from time to time, and I prefer —as I said last year—to submit these letters from practical men, as being likely, on that account, to be most useful to our farmers, for I find that much importance is placed by the agricultural community on the evidence as given before your Committee. This is doubtless due to the fact that there are so many agricultural interests represented in this Committee that the different conditions and methods applicable to these

different conditions are apt to be discussed and brought out. Mr. Lovelace, who lives near Ballymote, near London, writes as follows :—

'DEAR SIR,—Would you please give me the names and addresses of some reliable poultry and egg dealers in Toronto and Montreal ?

'I have forty Barred Rock hens and 140 pullets, and we got 24 dozen of eggs last week, and as it is scarcely three weeks since they started, I expect to get 40 or 50 dozen per week soon. The London prices at present, that is, in January last, 23 cents by the dealers, and 25 cents by the single dozen, and so I think it would be more profitable to send them to Toronto or Montreal.' (Certainly it would be.) 'I ran a 120-egg incubator for two years with good success, and am getting a 240-egg-size machine for this year.

'I sold 147 pair of birds, dressed, all to one butcher, the last season. The prices for the fore part of June were $1 per pair for 2-pound chicks, and the last half, 85 to 90 cents for same size. In July and the first part of August, I sold the rest at about 3 pounds apiece, the prices ranging from 85 to 65 cents. The dealer said they were the cleanest and most even lot he ever handled. As I have increased my plant, I intend to start my incubators early in February and try for the longer prices.

'You will remember adressing a farmer's institute meeting in Ballymote. Well, your two addresses did benefit me a great deal, in more ways than one.

'Your truly,

'R. S. LOVELACE.

'Ballymote, Ont.'

This letter shows the number of eggs it is possible for a farmer to get in winter by proper management and having the article at the right time, so as to get the good prices that he could receive by sending them to a market of high prices. That is only a good business procedure, as I have already said, to have your product when it is worth most. Then, we have the results from an incubator of 120-egg size proving so satisfactory that the determination is expressed to purchase one of 240-egg size, or double the capacity.

I read this with the object not only of giving information to our farmers in different parts of the district, but also to prove the different points that I have submitted to you. We have also the successful sale of poultry in summer and fall months. Money was made in winter by selling eggs, and in summer by the sale of poultry flesh.

Then, there is the expressed determination to increase his poultry plant as a result of success, and the benefit derived from practical instructions given at a farmers' institute meeting.

You will, gentlemen, I think, admit that, coming from a practical farmer, the foregoing is strong corroboration of the ground I have taken, and it should also be of great benefit to other farmers.

By Mr. Wilson :

Q. When did he sell the poultry ?

A. He sold it in July and the first part of August.

Q. In what city ?

A. He says in his letter : 'I sold 147 pair, dressed, all to one butcher, the last season.'

Q. Where did that butcher live ?

A. In London, Ont. I appreciate the point you make, because these are uncommonly good prices for London. Perhaps these prices would not have been obtained five years ago.

Q. They are certainly good prices. I hope he will continue to get them.

A. Prices have gone up. Permit me to say, that the other day chickens sold for $1.25 a pair in this city.

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Q. What were their weights ?
A. Between 2¾ and 3 pounds each : between 5 and 6 pounds a pair.
Q. That is hardly as dear as the other.
A. Perhaps Mr. Lovelace's experience may be an incentive to others

By Mr. McEwen :

Q. What do the incubators cost, the 120-egg size ?
A. They cost from $20 to $22.
Q. Apiece ?
A. Yes. And then there would be the brooder.

By Mr. Gould :

Q. To work successfully you require the brooder ? Does the first price mentioned include the brooder ?

A. No, the brooder would be $5 or $6, according to size, perhaps $7 ; but if an incubator and brooder were bought together, from the same party, there might be a small discount. There is no trouble in making a brooder. The incubator is the principal machine of the two. Any ordinary mechanic can make a successful brooder, but I should advise a beginner to buy a good brooder from a manufacturer first, and then, if he made one, to copy the best points.

Q. It seems to me, it would be necessary to have a brooder with early chickens.

A. Yes. I have recommended the farmer to hatch out his chickens in May, for the reason that it is comparatively easy to operate his outside brooder at this season of the year. If he got chickens earlier, as I have already said, he would have to have an incubator room and a brooder house (special facilities), which farmers under ordinary conditions are not likely to have. It is better to conform with the May conditions. The farmer who sets eggs under a hen, or puts them in an incubator, in April, and has his chickens out in the first week of May, will find that they grow rapidly with the grass. If he has a brooder, he will have little trouble in keeping it warm.

By Mr. Erb :

Q. These letters, I suppose, will be printed in the report ?

A. Yes, in the report of my evidence before this Committee. That is why I have taken advantage of the opportunity to submit them to the Committee.

Now, the next letter I shall trouble you with is one from Mrs. W. C. Hogg, of Uxbridge, Ont. She says :

'I have got early chicks this year again. I expect that I did not have them early enough last year. I use a Toronto incubator and brooder. I like them very well. I have had as high as 86 come out of 126 eggs. I had pullets hatched the last week of March of last year, 1902, and they were laying the last week in September. How is that for Plymouth Rocks ?'

The foregoing letter shows success in artificial hatching and rearing. Also, early laying by early hatched Barred Plymouth Rock pullets, which the writer strongly recommends.

Next is a letter showing fair success in managing incubators, but splendid success in rearing chickens in brooders. It is from Mr. D. W. Anderson, of Douglas Point, N.B. He says :

'Dear Sir,—Your letter of a recent date to hand. I have got two hatches out ; from the first I got 190 chickens out of 220 fertile eggs. All the rest were clear. Second hatch, 184 chicks out of 227 fertile eggs. I have a 360 Cypress incubator. I got my eggs from the farmers and out of the stores. It has been a very cold spring. I lost only six chickens out of 374.'

By Mr. Erb :

Q. Comparing the results of the incubator with the hen, how do you come out ?
A. Much about the same.

By Mr. Stewart :

Q. How many eggs did it take to get that number of chickens ?
A. In the first case, 360. The same in the second.

By Mr. Maclaren (Huntingdon) :

Q. Had this party more than one incubator ?
A. No, he had one, but it was used twice.

By Mr. Wilson :

Q. Does he state what became of the other eggs ?
A. No, but he says that 'I got my eggs out of stores and from farmers. We have had a very cold spring, but I only lost six chickens out of 374. The chickens are doing fine.' That is certainly a very small percentage of loss. It is satisfactory.

By Mr. Maclaren (Huntingdon) :

Q. Certainly, very satisfactory.
A. Yes, it is indeed.
Q. How many eggs did you say he had put in his incubator ?
A. 360 on both occasions.
Q. And he lost 170 on the first occasion, and 176 on the second ?
A. Yes ; but all were not fertile eggs.
Q. Would it not be better to sell eggs than raise chickens at that rate ?
A. That is a fair question.
Q. Especially if he could get 45 cents per dozen for them ?
A. That is a phase of winter poultry keeping that is exciting much consideration. The point you suggest, as to whether it is not best in our cold regions to sell the winter eggs at the high winter prices rather than to try to convert them into chickens to sell as early broilers, is a most important one. The raising of broilers is a specialty requiring expert knowledge and special buildings, which farmers have not. The farmer should certainly sell his winter eggs. In the earlier part of my evidence I advise farmers to set their eggs in April and hatch out their chickens early in May, and to have as many as he can at one time, and my contention is that artificial means will enable him to do so, for early sitters are, as a rule, scarce.

By Mr. Stewart :

Q. Would you call it a good result to hatch out one chicken from two eggs ?
A. No, but Mr. Anderson was having his first experience, and, considering that fact, I do not think results so very bad.

By Mr. Wilson :

Q. Where eggs show no development, what is done with them ?
A. At poultry establishments, the eggs which are clear, that is, in which there is no germ to develop after being tested out, are usually fed to the young chickens.

By Mr. Robinson (Elgin) :

Q. Do you allow any of your hens to set themselves ?
A. Yes.
Q. Do you have better results than with the incubator ?
A. It depends on circumstances. If the breeding stock is in good health and the germs are strong, the incubator will hatch out as many eggs as a hen will. A farmer should have no trouble in having from his fowls in April—even if the fowls have laid well all winter—eggs with strong germs. As I have already stated, farmers have opportunity to allow their hens run during winter in barn, stables or shed.

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By Mr. Wilson :

Q. If you were to give us the proper methods and the results you obtain, would it not be better and encourage them more ?

A. Certainly, we can do so ; but my object, at present, is to show what farmers themselves have more or less successfully accomplished, with the hope of such being an incentive to others. I have shown how by artificial means it is possible early in the season to get a large number of chickens at one time—say, 190—even if from 220 tested eggs. It would take a great many hens to give like results ; and if the farmer has to wait for broody hens, his chickens will unavoidably be late.

Q. I thought they were bothered by brooding hens ?

A. So they are, sir, but not until early midsummer, which is too late. We want the farmers to have early May chickens, to catch the high August prices.

LETTERS FROM MANITOBA ON RETURNS FROM WINTER LAYING.

I have some letters from Manitoba and the North-west, showing remarkable success in procuring eggs in winter. With your permission, I will give some extracts from them. Mr. Alfred G. Hepworth, of St. Laurent, Man., writes as follows :—

'I follow your reports and read them very closely. They must be a great benefit to very many. I have been getting eggs since November 7 from White Leghorns, hatched early in June, and since December from Black Minorca pullets. Plymouth Rocks are also laying satisfactorily. I have not a very warm place, as the water freezes solid every night, but what can be expected at from zero to 45 below ? After the experience I have had, I shall do my utmost to put up a house as nearly frost-proof as possible. I raised nearly 200 Plymouth Rocks last season ; many of the cockerels weighed 8 pounds at the end of November, some over that and some under. * * * I have not had one chick die a natural death. I had six or seven drowned in a very heavy storm, when they were about seven weeks old.'

This letter shows successful winter laying in Manitoba and great success in the raising of chickens.

The following letter shows most satisfactory poultry keeping by a lady in Assiniboia, and also shows her method of feeding growing chickens. It is from Mrs. George Shaw Page, of Moosomin, N.W.T., and she says :

'Very many thanks for your letter and valuable information, which I am so interested in. I am distributing the spare copies. My hens are laying, and have been since November, in spite of our extra cold stable. Often I find eggs frozen and burst open, if left an hour after they are laid. At present (February) we are having a very cold spell. The government thermometer registered 35 degrees below at 9 a.m., and went to 42 below during the night, yesterday, and it is quite as cold to-day. I got two eggs, though. My fowls are looking splendid, so red in the head and lively. I may add, I have for several years fed wheat boiled whole, instead of ground meal, for the first feed, and never suffer from their being too fat during the winter. It is much easier to feed. I put a half-pound tobacco tin full (a heaping pint) into the iron pot, with plenty of water to swell it, and put it on the stove immediately I return from feeding them their breakfast. Into it I put all I collect from the plates, scraps during the day, tea leaves, all the odds and ends I have. In the morning, by the time I have done my work, it is light enough to feed them, and the food is hot and ready, with no trouble and no mixing, which bothers a mother of a family at that time, and which, I am sure, is the reason fowls do not get hot food on farms. I give them potato parings or cut-up cabbage or one pint of wheat scattered at noon, or cut green bone ; and one quart of wheat at night. I rarely get any dead chicks in the shell. Then, I would say, I always feed my chicks for the first week with chopped egg and bread crumbs. My friends all ask why theirs do not grow so fast, fed on bread and milk squeezed dry. It is very

noticeable, the difference, and I see it myself. We took great interest watching the chicks grow last year. My chicks were all commented on, and I won first prize at our show here. I have always fed so, even in England.'

The following tells of the good prices obtained for early chicks sent to Winnipeg from Hanlan, Man., by Mr. W. J. Lumsden, who writes, under date of February 4, 1903, as follows :—

'Many thanks for the reports received from you some time since. We sold, and are selling every two weeks our cockerels dressed for 18 cents per pound delivered in Winnipeg. We got 21 cents per pound for our turkeys, all to private customers—a pretty good price.'

These and many farmers' wives whose names might be mentioned, if there were time, are successfully using artificial means in the hatching and rearing of their chickens. I might mention Mrs. Joseph Yuill, of Ramsay, North Lanark ; Mrs. R. A. Craig, of North Gower, Carleton county, and Mrs. W. J. Newman, of Engleside Farm, near Brockville.

THE NECESSITY OF PROPER TYPE.

Now, briefly reviewing the points made, the whole matter of successful poultry keeping resolves itself into the question of *breed*, *feed* and *proper management*. It is ever to be remembered that, in producing the early and most acceptable quality of poultry flesh it is absolutely necessary to *start* with the *proper type of bird*. And it is also to be remembered that the chicken must not only be of the proper type, but that, after being hatched by either incubator or hen, or raised by the latter or brooder, it must be carefully looked after and regularly fed from its birth to the time that it is of saleable age, be it three, three and a half or four months. It has already been said—but its importance warrants repetition—that the future fowl is made or marred in the earlier stages of its existence. Neglect during that period can never be repaired. Not all the subsequent cramming or forcing processes by machine or crating of the chickens can atone for wrong type, improper care, feeding or neglect. The chicken must come from the farmer to the wholesale purchaser, the crammer or crate in good condition, if it is ever to receive the high price for first quality.

A poultry raiser on a large scale from a frontier town, on the occasion of a recent visit to our farm, said to me that it is of vital importance to the exploiters of our first-class quality of poultry flesh that the farmers should understand that they must produce a chicken of the acceptable type and care for it properly until it leaves their hands. I have instructions as to proper care and feeding of the chickens, from time of hatching, *in extenso*, and I will ask you to allow me to incorporate them in my present evidence, as likely to be useful.

CHICKENS—WEIGHT ATTAINED AT THREE MONTHS OLD.

The question is often asked : What weight can we get the three-months-old chicken ? Experiments were made during the past summer with different breeds, in order to find the progress made by the different chicks. The following are the weight developments of the chickens up to three months of age, and previous to being used for experimental work :—

Barred Plymouth Rock cockerel at three months weighed 3 pounds 10 ounces. That is very satisfactory.

Another Barred Plymouth Rock cockerel at three months weighed 4 pounds 2 ounces.

White Wyandotte cockerel at three months weighed 3 pounds 11 ounces ; another weighed 3 pounds 2 ounces.

Two Faverolle cockerels weighed 3 pounds 7 ounces and 3 pounds 2 ounces respectively.

APPENDIX No. 2

A Silver Grey Dorking cockerel at three months weighed 3 pounds 15 ounces, and another weighed 3 pounds 3 ounces.

One Buff Orpington cockerel weighed 3 pounds 12½ ounces, and another 3 pounds 5 ounces.

A Rhode Island Red weighed 3 pounds 4 ounces, and another 2 pounds 14 ounces, not so good.

A Light Brahma-Barred Plymouth Rock second cross weighed 4 pounds 6 ounces ; another Light Brahma cross 4 pounds 3 ounces, and a third one 5 pounds 1 ounce.

Chickens obtained from a farmer near Carleton Place, Ont., for experimental fattening, weighed as follows :—Barred Plymouth Rock cockerels at two months and six days, 2 pounds 5 ounces, 2 pounds 4 ounces, 2 pounds 5 ounces, and 2 pounds 2 ounces, respectively. These chickens were taken from a field, but had been regularly fed and well cared for.

By Mr. Blain :

Q. What kind of feed is best ?

A. We give the chickens, when newly hatched, as their first feed, stale bread crumbs and egg hard boiled, in the proportion of one to three parts of stale bread crumbs. They are kept on that for two days. Then on granulated oatmeal for a week or so, and later a mash made of cornmeal, stale bread, shorts and the house waste, being particularly careful to keep from the chicken all fatty or salty food. At fourteen or fifteen days old, we give wheat at first for evening ration.

DESIRABLE TYPE OF CHICKEN.

I now submit to your attention some remarks as to the acceptable types of chickens. The chicken I have in view as a fit market type is one of rather small but blocky frame, showing a rounded breast, low straight breast bone well covered with flesh, and thighs carrying a generous proportion of meat, with light-coloured legs, as the ideal to be aimed at for export at three months. It is easier to secure this fowl at four months than at the earlier period. The objection to the present type cockerel at three, and in some cases four months, is sharp and prominent breast bone, with absence of flesh in desirable quantity. In the majority of cases this is not such a conspicuous feature at five months, but we are told that our five-months-old birds, of probably 7 or 8 pounds weight each, are too large for the British market. Our home market up to the present time makes no such objection, provided the birds show that they have been well fed and present flesh of fine grain and texture—in most cases indications of tenderness.

Having described to you what I consider a fit market type, we now come to consider how the best types may be produced. All varieties tried have produced chickens of desirable type, but in a limited number. It is a matter of congratulation that we have the desirable model furnished by several rather than by one variety. Selection of the best types from the different varieties, and breeding only from them, will eventually produce early chickens in numbers and shape wanted. Skilful and careful crossing of breeds, with the view of producing layers and flesh-formers combined, have resulted in Plymouth Rocks, Wyandottes, Orpingtons, &c., and their many varieties, which are hard to better as utility breeds. And what has been done so successfully in the case of these breeds can surely be repeated in the production of three-months-old chickens of acceptable shape, size and quality, so that they may be had in quantity sufficient to fill the demand.

Some difference in the requirements of the two markets may be noted. They are the preference of the English consumer for a white leg. We are not quite so particular on this side. Allow me to read the following letter from Dr. Boultbee, Manager of the Canadian Produce Company, Toronto. Under date of December 3, 1902, he writes me as follows :—

'I am afraid that I have said all I can, and all I know about export chickens many times; but I might say again, that the 3-pound bird, which means the same thing as the three-months-old bird, is what is wanted. In fact, we can sell a dozen chickens weighing from 30 to 40 pounds per dozen to one of all the other sizes, and the preference is given to small and young birds of large breeds, rather than to the same weight, but mature birds of smaller breeds. The call is more than ever, however, for quality. Everything else may go and is really of very small importance in comparison with this point. However, I am glad to say that the improvement in quality is marvellous. As regards methods of fattening, special attention should be given to processes which improve the colour and put on a fair amount of fat without robbing the breast of its lean meat. We receive many birds with every evidence of earnest endeavour to fatten, and every evidence of same as regards quantity of fat, but the birds are actually thinner than normal. I attribute this to carrying on the process too long. Careful experiments should be made to find the exact point from which the birds go back, and I think, for the average farmer, partial confinement, not in coops, and good feeding the most practical method.

(Sgd.) 'ALFRED BOULTBEE.'

A NEW MARKET TYPE ON TRIAL.

I wish to say just a word in regard to a new market type which is on trial. During the spring, I obtained three settings of eggs of a new variety of the Orpington family, named the Jubilee Orpington. It is claimed that this variety (originated by Mr. William Cook, the celebrated English breeder who is also the originator of the Buff Orpington variety) is one of the best and most rapidly developing market types known on this continent, at present. The eggs in this case were procured from Mr. W. S. Willet, the celebrated Orpington breeder of East Orange, N.J., who, when sending the eggs, wrote: 'Kindly watch the rapid development of this new claimant to market type superiority. I want particularly to have your opinion of them.' I may say, that their progress with us so far warrants all that has been claimed for them. We will certainly give them a thorough and searching trial.

I had intended to show you how to get these birds that Dr. Boultbee speaks of, but time will not permit. I wish to ask the Committee's permission to add to what I have said some information as to the proper care and feeding of chickens, turkeys, geese and ducks. The single copies of my 1900 report, and which contains full directions on these points, has run out of print. Added to the present evidence, such information, which is being continually asked for, will likely be of use to farmers and others.

The CHAIRMAN.—Certainly, if the Committee has no objections, you can incorporate the information with your evidence.

Mr. GILBERT.—I submit the foregoing to your attention this morning, gentlemen, and thank you for the kind consideration you have given them.

THE PROPER CARE AND MANAGEMENT OF CHICKENS.

After hatching out, the chickens should be allowed to remain in the nest for twenty-four hours, during which time they require no food. On being removed, with the mother hen, from the nest, they should be placed in a coop, weather permitting, outside on the grass. If inside, it is imperative that the chicks should run on dry earth or sand, or they will 'go off their legs.' Their first food should be dry bread crumbs, stale bread soaked in milk and squeezed dry, or granulated oatmeal. Feed a little at a time of either, or all alternately. Continue this treatment for eight or ten days, when crushed corn in small quantities may be fed. Give whole wheat after twelve or fourteen days. After the chicks have got firmly on their legs, a cheap mash may be made of table or kitchen scraps, &c., and fed in a 'crumbly' condition. Sloppy or sour food

will bring on bowel disorder. All food should be fed in such quantity that it will be eaten up clean. Leave no food about, to turn sour. Milk, sweet or skimmed, is one of the best foods and is very much relished. It need not follow that the rations be expensive or composed of all the constituents named. At first feed a little and often to the young chicks. Afterwards feed once every four hours, until so old that they can run in the fields. But at all times *feed regularly*. When the chicks have arrived at marketable age, the cockerels to be killed should be shut up and fattened. To do so quickly, put the bird or birds by themselves where they will be perfectly quiet. Feed and water regularly, and keep their pen or pens *scrupulously clean*. Meat, mutton fat, potatoes, barley, or corn fed whole, or in mash, are potent factors in fattening. A few small pieces of charcoal occasionally aid digestion, but where the chickens have a run, this is not imperative. Pure water should be in regular supply, and in hot weather it should be allowed to become warm.

TURKEYS, THEIR PROPER MANAGEMENT AND FOOD.

It is of first importance that our farmers breed the largest, best and hardiest birds. Climatic conditions, in the greater part of Canada, are favourable to the breeding of a large number of turkeys, indeed of all kinds of poultry. There are six varieties of turkeys, viz.:—Bronze, Narragansett, White, Black, Buff and Slate. Of these the Bronze are the largest and heaviest. The standard weights of this variety are :—

Cock	36 pounds.	Hen	20 pounds.
Cockerel	25 "	Pullet	16 "

The first requisite in successful breeding is strong, vigorous parent stock. In-breeding should be avoided. It is admissible to use a good male two years, but not so to use a young male and pullets of the same family. Young hens weighing 15 to 18 pounds, and older ones of 18 to 20 pounds weight, are the best layers, and make the best mothers. One male with 10 or 12 hens is a good mating.

Some turkey hens lay more eggs than others. Eighteen to twenty-four eggs from each hen should be satisfactory. The turkey hen makes the best mother, although some breeders give the first seven eggs to a common hen. The objection to the latter is that she is apt to drag the young pullets too much about.

Twenty-five young birds are all that the turkey mother can keep dry and warm.

It is of first importance to keep the young birds in dry quarters. Great care is necessary in rearing them until they 'shoot the red,' (get wattles, &c.). It must be borne in mind that young turkeys before 'shooting the red,' are the most tender of all feathered fowl, and afterwards the hardiest.

Too early setting is not advisable in this latitude. Where the winters are milder and spring earlier, it is different.

After hatching, the youngsters and their mother should be put in comfortable, dry quarters. Give a grass run, if possible. The coop should be roomy, and so conveniently situated that mother and brood can easily be driven into it, in case of rain. Care should be taken that mother and brood do not get into the grass while wet with the morning dew. It is important to remember this. It is also well to remember that experienced breeders have traced the death of many young birds, in their early handling of them, to damp quarters, lice and indigestion, the latter probably from eating uncooked food. Unclean, carelessly mixed and uncooked food has been the cause of death in the case of many young and tender birds. The mortality among young turkeys, from one end of the country to the other, is far too great, and is principally caused by neglect of the points outlined above.

FIRST FOOD FOR TURKEY CHICKENS.

For the first few days feed on stale bread soaked in milk and squeezed dry, and mixed with hard-boiled eggs, the latter chopped fine, and chopped onions. Chopped

dandelion leaves are excellent for young turkeys. Later on, granulated oatmeal, rolled oats, or a mash made of stale bread, onion tops, oatmeal, cornmeal or middlings mixed with skim-milk may be fed. The milk should be boiled and a little black pepper dusted into it before mixing it into the mash. All food should be cooked. It is important to bear this in mind. Uncooked, carelessly mixed or unclean food is the cause of much of the mortality among young turkeys. For the first five or six weeks, feed four times daily ; after that, three times. At the period of 'putting on the red,' great care must be observed that uncooked food is not given, or any sudden change made in the diet or treatment of the young birds. At this stage they eat ravenously, but must not be allowed to gorge themselves. After becoming fully feathered they will require nothing but hard grain. Turkeys are fond of roaming, and should have range. It is a good plan to accustom them to a feed of grain in the evening, so as to ensure their return home. In some cases it may be possible to allow the young birds and mother greater range than in others, without molestation from vermin. But under any circumstances do not allow mother and brood out in the morning dew ; keep them confined until the grass is dry. Great care must be taken to keep the youngsters free from lice.

Improved stock may be obtained by mating a bronze male with the common hen turkeys of the farm. It is better, however, to breed thoroughbreds, when circumstances permit.

DUCKS,—POPULAR BREEDS AND HOW TO RAISE THEM.

The three popular breeds of ducks are Pekin, Aylesbury and Rouen. Their respective weights are : Pekin drake, 8 pounds ; young drake, 7 pounds. Pekin duck, 7 pounds ; young duck, 6 pounds. Aylesbury drake, 9 pounds ; young drake, 8 pounds; Aylesbury duck, 8 pounds ; young duck, 7 pounds. Rouen drake, 9 pounds ; young drake, 8 pounds. Rouen duck, 8 pounds ; young duck, 7 pounds.

Ducks lay from 100 to 140 eggs in the season. After beginning early in the season to lay, they do not cease until the whole number is laid.

In mating early in the season, three, five or seven ducks are allowed to a drake. When running at large, the flock may be increased to eight or a dozen females. The drake should not be over two years of age.

Duck eggs take twenty-eight days to hatch.

After being hatched by a hen or one of their own species, the food for the first three or four days should be a mash composed of cornmeal, a little hard-boiled egg chopped fine, ground wheat, ground oats or granulated oatmeal, the whole to be mixed with boiling milk. Finely chopped cabbage, lettuce, clover or grass will be much enjoyed. Skim-milk may be given for drink in quantity as required. Cornmeal, bran and a little oatmeal mixed with boiled skim-milk until 'crumbly,' with green stuff, as mentioned, is an excellent ration. Young ducks should be fed five times per day. They must be kept in dry quarters and not allowed to get wet from rain or ducking in water. They must not be exposed to the hot sun. Feed in shallow pans or troughs. After two or three weeks the number of rations may be reduced to four *per diem*. When possible, allow a grass run. As the ducklings grow, the rations may be made more economical. Ground bone, beef scraps or cooked meat in shape of table waste will be much enjoyed. Small pieces of charcoal are great aids to digestion and good health. To fatten, feed on ground grains made into a mash, meat, beef, scraps, &c. Feed nothing calculated to give the flesh a bad flavour. Barley meal may be used in the mash.

GEESE—BREEDS AND MANAGEMENT OF.

The best-known breeds of geese, and their weights, are as follows :—

	Lbs.		Lbs.
Toulouse Gander	25	Young Gander	20
Toulouse Goose	23	Young Goose	18
Embden Gander	25	Young Gander	20
Embden Goose	25	Young Goose	18

Mating.—One gander to three females. Mate with large vigorous birds.

Management.—In spring make large comfrotable nests. In most cases two clutches of eggs are laid, sometimes three. Collect the eggs soon after being laid, as they are easily chilled.

Hatching.—Some breeders who hatch geese on a large scale use incubators. Mrs. Wolcott, Napoleon, Ohio, in *Ducks and Geese,* published by the *Reliable Poultry Journal,* Quincy, Ill., says : 'I incubate their first laying with chicken hens, and frequently let 'old mother goose' care for her second hatch. Be sure to have the hens, chosen for sitters, free from lice. Sprinkle the eggs with warm water twice during the last week. Oftener in dry hot weather will do no harm. Remove each gosling from the nest as it hatches, for they are easily mashed. Keep them in a flannel cloth in a basket in a good warm place until all are hatched.'

Sometimes the goslings have to be helped out of the shells.

Rations.—For first three days.—Similar food as that recommended for ducklings, or the following, by Mr. C. L. Darlington, Lloyd, N.Y.: cornmeal mixed with hard-boiled eggs, chopped fine, a pinch of black pepper and a handful of sand. After three days discontinue the eggs, and give bread soaked in skim or sweet milk, oatmeal or broken rice boiled until soft, outer leaves of cabbage, onion tops, and all the grass they can eat. Keep the young birds from water, but give it to them in liberal quantities to drink.' The same authority recommends as a fattening ration a liberal supply of barley meal and cornmeal, soaked in buttermilk. A grass run is indispensable.

LICE AND DISEASE GERM EXTERMINATOR,—RECIPE.

A remedy for lice-infected fowls and premises and for disease germs is frequently asked for. In the case of fowls in limited number—one of the many forms of carbolic powder is recommended. When in large numbers, one of the liquid preparations is the most speedy way in which to meet the difficulty. These liquid lice-destroying preparations have, in recent years, been put upon the market and are said to be efficient. For red mites and disease germs in poultry-house, a solution of

Corrosive sublimate	4 ounces.
Common salt	4 "

Dissolve in two to four quarts of water. When completely dissolved, dilute to 25 gallons.

With this carefully spray every crevice, nook and corner of the house, first, removing and burning all movable wood parts.

As the solution is highly poisonous, care should be observed in handling it.

Follow by whitewashing the premises. Before returning the fowls to the poultry-house, see that they are entirely free from vermin.

GERM DISEASES,—TREATMENT.

In all cases of germ diseases, the best and simplest treatment is to separate the ailing birds from the well ones, and thorough disinfection of the premises. As a precautionary measure, it is well to thoroughly disinfect the fowl-house once or twice every year.

Having read over the preceding transcript of my evidence, I find the same to be correct.

A. G. GILBERT,

Manager poultry division, Central Experimental Farm.

MANAGEMENT OF LIVE STOCK

HOUSE OF COMMONS,
COMMITTEE ROOM 62,
FRIDAY, June 19, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock a.m., Mr. D. K. ERB, Chairman pro tem., presiding.

Mr. J. H. GRISDALE, Agriculturist of the Central Experimental Farm, was present by request of the Committee, and submitted the following evidence :—

Mr. Chairman and Honourable Members of the Committee on Agriculture and Colonization, I am very glad to meet you once more, and hope I may be able to answer any questions you may choose to ask, and to give you briefly an outline of the important work we have been carrying on in my department at the Central Experimental Farm. I cannot hope to cover the whole ground this morning, nor could I do so in two or three mornings ; but I would like to give you a synopsis and to discuss briefly two or three subjects that I think are of importance to the country. I would like, therefore, to begin by taking up the work with our dairy herd, since dairying is the industry which may be said to be of primary importance to Canada at the present moment, and will no doubt continue to be the chief source of wealth to Canadian farmers for many years to come.

THE HERDS,—INFORMATION SOUGHT, BY TREATMENT.

As you will understand, and as any of you know who have visited our stables, we have four herds of pure bred cattle and a grade herd of each of the breeds. To begin with, we have the Ayrshires, ten females in number—not a large herd from a breeder's stand-point, but you will understand that where we have to keep four or five different breeds and grade cattle of the same breeds beside, it is quite a sufficiently large herd. We have an equal number of Dairy Shorthorn females ; a herd of 8 or 9 Guernsey females, and 5 Canadian females, as well as several bulls of each breed. The idea in keeping these different herds of pure bred and grade cattle is to determine, if we can, the classes of cattle that are most suitable for the different conditions or requirements of Canadian farmers. We do not pretend, we do not hope to show by our experiments or dairy work that any one breed is superior to any other breed. What we do hope to do, is to determine the condition, that is feeding conditions, care, and so on, under which certain breeds will give the best results, and to determine, if we can, the kind of returns that are most easily and profitably secured from the different breeds. For instance, from the Ayrshire we get a large supply of milk, and we find that under certain conditions they may do much better than either Guernseys or Shorthorns. One of our chief aims has been to see how the cost of producing 100 pounds of milk can be reduced, to determine exactly the cost of the same, and to get the farmer working along the same lines.

VALUE OF A DAILY DAIRY RECORD.

With this aim in view, we have found that probably the most potent factor in the development of a herd is to keep a record of the annual milk and butter fat product of the individuals of the herd; of course, we have always done that, but we have been trying to get the farmers to do it the last two or three years, and with that object in view, we have supplied a number of farmers with forms for keeping records of the milk and butter fat yields of their individual cows. I have samples of these forms here, that is, of the 'Daily Dairy Record' form, which are supplied to any farmers who ask for them. There is room on them to keep a record for one week of the work of 15 cows. On the back of them are to be found the necessary instructions with the information as to where more of these forms may be secured, if desired. Then, we supply a form on which may be recorded a summary of the work for a month. These have been sent broadcast from the Atlantic to the Pacific, and have, we think, done very good work. I could give you lists, quite long lists, of men who are using these, and I must say that the returns have been most satisfactory, that is, men who have used the forms speak very highly of their value as guides and incentives to improvement in their herds. The unsatisfactory part of it, I regret to say, is that there are not nearly enough using them. Some who have used them in this immediate neighbourhood, and in different parts of Ontario, have had remarkable success with them. Just to give you an instance : A man, not 80 miles from here, started two years ago with a herd of 11 cows, giving an average return from the factory of $30 per head. He kept these records, and with their aid was able not only to improve the cows he had, but to pick out those that were not doing the right thing by him, and replace them with better cows, so that last year he had a return of over $62 per head from his herd. Other instances are quite common of men who have done almost as well. Many breeders of pure bred cattle are taking up this system, because the first question that the man who comes to buy a bull from a pure bred herd for dairy purposes, is not, 'what sort of a looking cow was the dam ?' or 'what sort of a looking animal was the sire ?' but 'what could his dam do at the milk-pail, and what could the dam and sire show in the records of their progeny ?' And to do this, to be able to give this information, it is not sufficient to say that the cow gave 65 or 70 pounds of milk per day ; he must be able to say how many pounds she gave in the year. Many cows will give 65 pounds in a day, at the start, but much less in the year than the cow that starts off with only 40 to 50 pounds a day. You will, therefore, see the value of these records to the breeder of pure bred cattle, and many are introducing them. Several men interested in cattle have got out statements of the records made by their herds, and these have proved a very great advertisement for them, because they show just what their cattle can do, and what kind of stock they are. On the back of the forms, you will notice it is stated that a paying herd must produce 5,000 pounds of milk per cow. That does not sound very big; many cows in the country do better than that. But if you look up the census returns for many dairy cows in the country, you will be astounded to find that, allowing for every pound of milk that can possibly be used on the farm by any means at all, it is under 2,000 pounds per cow. That may seem very strange, but I am taking these figures from the last census, and allowing for the fullest possible amount of milk that can be used in any homestead, the average production is less than 2,000 pounds per cow. You will see what an immense loss the country sustains by keeping so many useless or poor cows. It is these useless cows that we want to get rid of in our dairy industry, in order that the average production may be raised to what it ought to be; and the only way to eliminate these animals entirely from our herds is for the farmers to keep a record of the production, so that every farmer will be able to see for himself what he is losing by keeping a poor class of dairy cattle.

COMPARATIVE COST OF PRODUCING A GIVEN WEIGHT OF BUTTER.

The cattle upon which I reported to you last year, some of which were newly imported from the old country, have done very well, and any of you who have looked

through the report will see the high record of returns from each of the herds. I might just give you a few items of interest. We have the imported Ayrshires, and last year they gave us an average of 7,496 pounds of milk, an average of 334⅔ pounds of butter, and the average value of their product was $74.18, including the skim milk at 15 cents per 100 pounds, an average profit on the herd of $36.26. That was after paying for every pound of feed. Labour is not included. I might say that one-half of that herd was composed of heifers with their first calves. The Shorthorns did very well with a herd of four, one of which was not doing satisfactorily, as she had only two milking teats. They gave an average of milk of 7,210 pounds, of butter 353 pounds, and the average value of the product was $77.41. But the profit was only $32.50. Of course, I must say that the calves are not included in any case ; they are a very uncertain quantity, and we are keeping a good many and cannot give their actual selling value. From the Guernseys, a herd of five, we got an average of 6,130 pounds of milk and 359 pounds of butter. The product was valued at $76.87, leaving a profit of $37.29.

The Canadian herd last year consisted of one grade cow for the year and one pure bred cow for about three months. The grade produced 9,932 pounds milk and 506·49 pounds of butter, while the pure bred cow produced 1,866 pounds of milk and 109·94 pounds of butter in eighty days.

The comparative cost of the production of a pound of butter by each herd is of considerable interest. The Ayrshires cost, to produce a pound of butter, 11·34 cents.

The Shorthorns, 12·68 cents.

The Guernseys, 11·02 cents.

The Canadians, 9·36 cents.

By Mr. Smith (Wentworth) :

Q. Is there anything allowed for the labour ?

A. No, sir, there is nothing allowed for the labour and nothing for the manure. Those are two quantities which are most difficult of calculation.

Q. You figure everything else, do you ?

A. Everything else.

By Mr. Robinson (Elgin) :

Q. You turn the labour against the manure ?

A. We turn the labour against the manure. That is as near as we can do. If a man is doing all he can, that is, if he is taking care of as many cattle as he can, the manure will more than pay his labour ; but I will not say that it more than pays the labour in connection with these herds, because, on account of experimental work, it is necessary to have a man for about 18 cattle, and that number will not produce enough manure to pay for the labour of a man.

COMPARATIVE COST OF MILK AND BUTTER, BY HERDS.

Q. How many Shorthorns did you make use of in making that calculation ?

A. Four.

Q. And how many Shorthorn cows have you ?

A. We have four in milk, three others in calf, as well as two yearlings, and several calves besides.

Q. Those that are in calf, are they calving for the first time ?

A. Yes, for the first time. We shall not have a large herd next year either, because some of the present milkers will have to be disposed of.

Let me now give you the average cost of producing 100 pounds of milk in each herd. I will just go over and compare the cost of producing a pound of butter and 100 pounds of milk in each herd.

To produce 100 pounds of milk with the Ayrshires cost 50·6 cents, and to produce 1 pound of butter, 11·34 cents.

With the Shorthorns the cost of producing 100 pounds of milk was 62·15 cents, and 12·68 cents for 1 pound of butter.

With the Guernseys the cost to produce 100 pounds of milk was 64·57 cents. You will notice that the price is away up, but the cost to produce 1 pound of butter with the Guernseys was only 11·02 cents. With the Canadians the cost of producing 100 pounds of milk came down, and the cost of producing a pound of butter was still lower. The 100 pounds of milk cost to produce 48·93 cents, and the cost of producing 1 pound of butter came down to 9·36 cents.

Now, this shows several things. The economy of production of these small cattle is much greater than where large cattle are used, but the objection to them is, that you cannot get as large a product, and you have to keep more animals, so that the labour question enters, and where a large herd is kept, that has to be considered. Then, you cannot consume as much roughage. An animal of small breed will not consume nearly as much as an animal of the large breed, and, as you all know, in any manufacturing concern the bigger the machine, the greater the productive power, the more profitable it is, generally speaking ; and this rule seems to apply with dairy cattle, if we may judge from experiments in different parts of the world.

By Mr. Sherritt :

Q. The proportion is about the same with the Canadians, as with the other breeds, and I presume they are less expensive ?

A. No, sir ; they are pure bred and expensive—not quite as expensive as the Ayrshires, when we get them landed here, but we have to pay as much for them, prime cost. They range from $100 to $150.

By Mr. Boyd :

Q. How about their weight ?

A. They are about 100 pounds lighter than the Ayrshire on the average, and the Guernseys are about the same weight as the Ayrshires, a little lighter, perhaps 50 pounds apiece. The Shorthorns are, of course, a good deal heavier, about 300 pounds heavier than the Ayrshires.

By Mr. Erb :

Q. Your figures are based altogether on butter ?

A. Yes.

COMPARATIVE COST OF CHEESE PRODUCT, BY HERDS.

Q. If the milk had been converted into cheese, the results might vary ?

A. Yes ; the cost of producing a pound of cheese with Canadian milk would be greater than with Ayrshire milk. Well, no, that is not the case either, because the cost of producing 100 pounds of milk is, I think, the real guide, and the Canadian milk costs only 48·93 cents, while Ayrshire milk costs 50·6 cents per 100 pounds.

Q. One hundred pounds of milk with a certain breed might be worth more for cheese than for butter ?

A. Yes, because, for instance, 100 pounds of Ayrshire milk will give in proportion more cheese than butter.

Q. In the case of Holsteins it would be still greater ?

A. Still greater in proportion. Of course, 100 pounds of Ayrshire milk will not make as much cheese as 100 pounds of Canadian or Guernsey, but it will make more cheese in proportion than it will make butter. One hundred pounds of common Canadian milk will make, say, 5½ pounds of butter, and the same quantity of Ayrshire only,

say, 4¼ or 4½ pounds, whereas of cheese 100 pounds of Canadian milk might make about 11 pounds, while 100 pounds of Ayrshire milk might make only about 10 pounds, probably a little bit better than 10 pounds. So, the proportion would be one-tenth greater of cheese, but it would be one-fifth or one-fourth greater of butter in favour of Canadian.

By Mr. Boyd :

Q. It seems as if the Canadian was best for dairying ?

A. The objection is, that they are very small. I do not know if you have seen our herd or not, but the individuals are the largest that could be secured, and they are smaller than the individuals in our other herds.

ORIGIN AND PERPETUATION OF THE NATIVE CANADIAN COW.

By Mr. Stephens :

Q. Where did you get them ?

A. One of them at Oka, on the Ottawa River. One at St. Norbert, on the Great Northern Railway, below Joliette, one at Roberval, in the Lake St. John district, and one of them at St. Denis de la Boutillerie, in Kamouraska.

By Mr. Smith (Wentworth) :

Q. Are they registered animals ?

A. Yes.

Q. What are they supposed to go back to ?

A. They trace to the original importation of French cattle, brought over with the settlers early in the seventeenth century, and they have been kept more or less pure on both sides of the St. Lawrence, from Three Rivers down. There are more of them on this side of Three Rivers to-day than beyond, but that is due to the greater energy and progressiveness of the farmers in the western part of Quebec, as compared with those in the eastern part. Another point is, that the cattle in the western part are stronger on the average than in the eastern part. When visiting these sections, looking up these cattle, I found the great difficulty was to get good, strong individuals. We knew they were a good dairy breed. We did not need to get them on the experimental farm to show that. They showed themselves fit to enter any competition at the Pan-American ; but the great objection to them amongst progressive producers of milk is their small size. At the Pan-American, you will remember, one or two were very small. Now, if you notice our herd, they are large, and I think we are doing a service to the country in establishing there a good-sized herd of large cattle of this breed, because they are undoubtedly a profitable class. They resemble the Jersey in their product, although the milk is not quite so rich, but they are much more hardy than the Jersey ; they seem much less subject to ills. They seem to be able to stand our climatic conditions much more readily than do the Jersey, and for that reason I think they are a Canadian asset well worth considering and helping along.

By Mr. Boyd :

Q. Do you think that their small size is attributable to in-breeding ?

A. In a measure ; but I believe the principal reason of their smallness is the neglect to which they have been subjected for years. The average French farmer kept them years ago, and is keeping them to-day, down in the eastern part of the province, without sufficient food. He keeps them during the summer on a little patch of grass, or on a knoll which is of no use for anything else, and in winter he keeps them on straw, and no cattle can grow to any size under such conditions. The herds down in Kamouraska and through that district contain very few large animals. The cow we bought there was very much larger than the average in the herds around there, and I

think we can, by judicious breeding and by selection, increase the size of these cattle and still retain their hardihood and milk-producing qualities.

By Mr. Smith (Wentworth) :

Q. Are nearly all the cattle kept down there of this breed ?

A. They are, in certain districts. In the Montmagny district there are a good many herds. Then, when you come up this way, they are, like the Ayrshire herds, scattered here and there, but each breeder is careful to retain the breed in its purity. There are some very fine specimens of sires in the country, the inferior sires are being carefully weeded out, and I expect to see, inside of twenty-five years, more strongly developed animals and a large number of herds in Quebec and eastern Ontario. Wherever dairying is carried on, there is no doubt this breed deserves a place, and more especially where dairying for butter production is concerned.

Q. Has registering been at all universal ?

A. Some fifteen years ago, a number of the breeders who had been trying to keep their cattle of this breed pure, got together and organized an association. They made Dr. Couture, of Québec, their secretary, and since that time, by inspection and record, judging the cattle by inspection and milk record, what they call in French *la souche,* that is *original stock, foundation stock,* has been admitted into the herd book, but the books are now closed for foundation stock. The offspring of those already registered are the only ones that can be admitted to the book at present and it is supposed no more will be allowed to enter. There are, however, a few more good individuals in the country. In my inspection I came across several that were well worthy of registration by appearance and returns, but I suppose a stop had to be made some time and they ended it up three years ago.

By Mr. Erb :

Q. Are these the kind of cows found mainly in that part of the province of Quebec known as the Eastern Townships ?

A. No, there are a good many of the breed there but the majority of the cattle in that district are Ayrshires and Shorthorns, and their grades and crosses.

Q. That is a great dairy section ?

A. It is. These cattle were, as I said, kept for many years down along the St. Lawrence on both shores—in fact they are kept there yet—but they are finding their way up and you will find grades of the breed all over Eastern Canada. In Ontario, in the Madoc and Myrtle districts there are more or less of these cross-bred Canadian cows, little dark cows something like the Jersey but darker and more sinewy.

By Mr. Boyd :

Q. I saw them exhibited here 23 years ago.

A. Very likely.

By Mr. Erb :

Q. What is the name they are registered under ?

A. They have had various appellations. They have been known as Quebec Jerseys, Jersey Canadienne or Canadian Jersey, and now they are all officially called Canadians. I might say that some years ago some breeders brought Jersey sires and crossed them on these cattle and called the offspring Canadian Jerseys. Some others brought in Ayrshire bulls, but after three or four Canadian top crosses the progeny were allowed to come into a certain herd book. Later, however, only those of known pure Canadian breed were allowed in the Canadian cattle herd book.

By Mr. Robinson (Elgin) :

Q. How many have you at the farm here ?

A. We have five females, a good bull and two or three calves. We have only four females in milk. Now, if there are no further questions on this subject I will go on

with the next subject I have in hand, that is beef production. Before taking up the experimental work we have been conducting the last few years at the Experimental Farm, I want to say a word or two about the selection and feeding of beef cattle.

By Mr. Boyd :

Q. How long will it take you ?
A. About an hour and a half.
Q. I think we had better adjourn till there is a larger attendance.

HOUSE OF COMMONS,
COMMITTEE ROOM 34,
WEDNESDAY, June 24, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock a.m., Mr. Douglas, Chairman, presiding.

Mr. J. H. GRISDALE, Agriculturist of the Central Experimental Farm, was present by recall, and was examined as follows :—

Mr. Chairman and Honourable Members of the Committee on Agriculture and Colonization, when you adjourned last day I had just about finished the discussion of milk production and was taking up the beef question, and I will, with your permission, take up the work at that point to-day.

THE PRODUCTION OF BEEF,—COMPARATIVE COST.

In Canada, especially in the eastern portion of Canada, the usual method of producing beef has been to keep as farm stock dual purpose, or what some people call general purpose, cows; to keep the offspring of these and feed them till they are three or four years old and then send them off as butcher meat to the markets of this country or for export to Great Britain. The growth of the dairy industry has done much to injure this industry by the introduction of special purpose cattle, of which there are a great many now in Ontario, Quebec and the eastern provinces. The advantages of the old general purpose cow, the breed which seems to be coming into favour again, are many, but there are also certain disadvantages. One of the principal advantages is that the calves are valuable for beef production, while the calves from the special purpose cows may be used for vealers only or, as is frequently done, killed a few minutes after being dropped. Secondly, the general purpose cow, after she has ceased to give milk, may be fattened and her carcase used as beef; or if any accident happens which interferes with her milking qualities she may be fatted and sold off. Another point in her favour is that she is probably less liable to the particular diseases to which these special purpose dairy breeds are subject, as, for instance, milk fever or other diseases induced by heavy milk production. One of the disadvantages is that they are more expensive to keep than any other cattle. Our Ayrshires last year cost $37.92 to feed for the year, while our Shorthorn cows, that is the general purpose herd, which we have at Ottawa, cost $44.91, a difference of between $7 and $8 in favour of the special purpose cows. And as a consequence with such cattle it costs more to produce 100 pounds of milk. In the case of the Ayrshires it cost 50·6 cents to produce 100 pounds of milk, while with the Shorthorns it cost 62·15 cents, so you see there is a considerable difference in favour of the special purpose cow. In the cost of a pound

of butter also there is considerable difference against the general purpose cow, in the case of the Shorthorn it cost 12·68 cents to produce a pound of butter, while with the Ayrshires the cost was 11·34 cents, something over a cent in favour of the special purpose cows. I think the above points summarize the differences between special purpose and general purpose cattle.

By Mr. Wilson :

Q. Does that cover the feed and the cost of taking care of them ?

A. No; as I have said already, we neglect the care and we neglect the manure.

Q. What do you mean by neglecting the care ?

A. We do not estimate the cost of caring for them, nor do we put a value on the manure.

Q. Do you think one would offset the other ?

A. If you value the manure at the usual value put on it by experimenters and chemists the world over, it will.

Q. What is that ?

A. That is, value it according to the fertilizer content of a ton of manure.

Q. It will then depend on the size of the herd ?

A. Yes ; if a man is looking after all the cattle he can, the manure will pay his wages, valuing it at, say, even $1 a ton ; if he is not caring for all the cattle he can, it will not. In our case it will not, because we have to weigh the feed, to keep the animals particularly clean, and sweep the stables twice a day. The average farmer does not have to weigh the food, or curry his animals every day, or sweep out his stables twice a day.

Q. You do not look on that as necessary for the ordinary farmer ?

A. No ; that is why I say we neglect this. If we had to add this on, we could not produce that 50-cent milk at less than, say, 65 cents.

A TWO HUNDRED ACRE FARM.

Q. What I would like to see done with that 200 acres, would be to run it as an ordinary farm, so that the farmers could see what could be done with an ordinary farm?

A. Would you think it advisable to sacrifice the good appearance of the farm and the experimental work going on there for the sake of that, or do you think we should make allowance for that ?

Q. I think the experimental work should be done elsewhere. I think it is a very important part of the experimental work to show how a farmer can run a 200-acre farm.

A. You would consider the utilization of the products ?

Q. As far as you can.

A. Have not only the work on the farm, but the work with the cattle ?

Q. Yes.

A. Of course, you might run that 200-acre farm thus : Keep, as we do already, an exact record of all feed produced thereon, allow for the loss due to age, and value the fully-cured product at market prices. Then, feed all food to cattle and estimate value of by-products returned to the farm, and charge labour at current rates of wages.

Q. That is not what I mean ; I mean, running the farm as it would be run in mixed farming : keeping the number of cattle that you could make use of, the number of horses, sheep, hogs, implements—just a regular farm.

A. Of 200 acres ?

Q. I think that would be very interesting to the farmers.

A. I admit it would be very interesting to farmers. As things are organized at present at the Central Experimental Farm, it would be practically impossible. We would have to have a separation of all stables and implements. At present our implements are used by all of the departments. Our rakes and binders, of course, are only

used by ourselves and the experimental department, but our other implements are used in every department—I mean, harrows, ploughs, &c.

Q. Don't you think it would be a most profitable experiment ?

A. I think it would be a really good experiment. We are trying to come as near that as we can with our present arrangements.

Q. Maybe, but I think the government might consider the possibility of buying another farm for that purpose ; the money would not be wasted.

A. I think it a most important matter.

Mr. Ross (Ontario).—But a farmer might not have all the capital he wants, while the government would have.

Mr. Wilson.—My idea is to run a business farm on business principles.

EFFECT OF BREEDING CATTLE ALONG FIXED LINES.

By Mr. Ross (Ontario) :

Q. In your milk comparison there—I tried to follow it, and I understood that, according to that particular test which you made, that the Ayrshires were the leaders in the production of milk ; that is, they cost less ?

A. Compared with dual purpose cows ?

Q. Yes.

A. They cost 12 cents a hundred pounds less.

Q. Do you reason from that that the Ayrshire is the best milker ; have you considered it all round ?

A. I am not prepared to say that the Ayrshire is the best milker ; I am giving you our findings.

Q. That is what any one reading that report might think.

A. Well, yesterday, I gave a summary of the whole thing. This is just to show the comparison with the general purpose cow.

By Mr. Kidd :

Q. You do not compare them with Holsteins or other dairy cattle ?

A. No. I just took Ayrshire cows, because it is the breed of which we have the largest herd ; it was with the average of our dual purpose cattle.

By Mr. Ross (Ontario) :

Q. When you compare them with Shorthorns there, you compare what we call milking Shorthorns ?

A. Yes ; our Shorthorn herds are dual purpose cattle, selected for their milking qualities, as well as for their good beef-producing qualities. We try to get the two things combined, as near as we can. It is very difficult to secure such cattle, I may say, very difficult indeed.

By Mr. Johnston (Cardwell) :

Q. When you take a Durham, the Durham milker will put on flesh, and the other won't ?

A. Not if you feed her properly, she won't.

Q. If you feed equal quantities as well as to the Ayrshires, they will give more milk ?

A. You will get individual Shorthorns which will give as much, but on the average the Ayrshires will do more.

Q. If she gives more, she will eat more to do it, won't she ?

A. Yes, but generally the heavy producer takes less to the hundred pounds of milk produced than the inferior dairy animal.

Q. But they usually put on flesh ?

A. Not always. Well, probably more frequently. I know, more frequently than the other, but not always.

Q. Do you not think that there is a great deal in a cow having been forced from birth into flesh, that it prevents her from milking equally with the others ?

A. Yes, and then there is a great deal in the fact that the Shorthorn has been bred for centuries along flesh-producing lines. We have two or three heifers at Ottawa here that, while they do not get anything but grass, are really fat ; you could not give them anything less than that. The Ayrshire heifers that are beside them in the same field are in what we call good dairy cow condition.

RESULTS FROM BREEDING AND FEEDING.

Q. If you take an Ayrshire and a Durham cow and put them on good grass, the Ayrshire will produce butter and very little flesh, but the other will produce pretty nearly as much butter and twice as much flesh ; so that the cow for the farmer of Canada is one that will produce milk and flesh, because the meat usually produced will more than compensate for the slight loss in butter ?

A. I did not say that.

Q. Do you not say that ?

A. No, I am not going to put myself on record on that point ; I am trying to find that out. We have two herds there, and we are studying this thing every day.

Q. Provided you set them up one month on the best grass you can get, and you value the butter, and you value the amount of flesh which they have put on, which will there be the most money in ?

A. That is just the question. You see, the average farmer does not want to keep his cattle only one year, and what is the value of that extra gain in flesh the next year, or the second year, or the third or fourth year afterwards ? It is only once that the flesh is of value, whereas the butter is of value every year ; that is the point against the dual purpose cattle. If it were the last year you were going to keep the cow, then the meat would be of value, and I think it might be in favour of the Durham or Shorthorn, although I am not sure of that either. At the Pan-American, Canada had some Shorthorn cattle in the test, and the increase in weight was valued at so much per pound ; still, the Shorthorns did not come out ahead of our special purpose cattle. We still have the cow that we bought at the Pan-American exposition, and she does not gain very much : she puts it all into the pail.

I might say, we have two herds of dual purpose cattle and six herds of other cattle. We expect to continue this experiment for some time, to determine, if possible, the relative value of the two classes of cattle, special purpose and dual purpose, to the Canadian farmer.

Q. Do you allow their calves to suck the cows ?

A. We do not.

Q. If you take the calf and raise it on skim milk and use it the same as you do the Ayrshires, they are greater producers of milk ?

A. Yes. We have an interesting example of that at Ottawa at the present time. We have one that has been suckled and the other fed by the pail, and there is a great difference in the conformation, and I think there will be a great difference in their ultimate values, as milkers. There is no doubt that the beef-producing qualities of the Shorthorn are due very largely to the breeding and feeding in their early life, as well as to the long training their ancestors had along these lines.

CONCLUSIONS FROM EXPERIMENTS IN FATTENING.

Now, as you know, we have been carrying on several lines of experimental work at the experimental farm here in beef production, and before going

into that, I want to give you a few deductions we have drawn from our observations and experiments. The first thing is the selection of feeders: we have been careful in picking these out, to get as uniform a class as possible, and generally speaking, we pick the best that are to be found anywhere in this neighbourhood, or if necessary, when good feeders are not to be secured here, we go farther west. Last year, we were compelled to pay a very high price indeed for our feeders, and this spring, as you know, the price of beef dropped, and we were able to get only a very little higher selling price than the figure at which we bought, and unless you have a good margin, I may say, it is impossible to make a profit in feeding the best. We have tried over and over again, and find that you need over a cent to make it profitable to feed, because you cannot produce a pound of gain for the average live weight selling price of beef on the market ; therefore, you have to buy your steer at, say, 4 cents and sell him at 5 or 5½ to make a profit. This has been possible in past years, but this year has been an exception. To illustrate this point, I might say that prime or choice feeders on the best markets, last year, were worth $4.75, and the product of these, these cattle finished, were selling this year for $5.40. It is quite impossible to make a profit under such conditions. Now, good feeders could be bought for $4.20 to $4.55, last fall, and their product brought this year only $4.15 to $5.40, whereas the year before they brought from $5.75 to $7.15. Medium cattle, last fall, could be secured in the best markets for $3.85, and they sold this spring for $4.90, live weight, a margin of $1.05, which made the feeding of that class of cattle profitable. Common feeders could be secured for $3.60, and these sold this spring for $4.80, leaving a margin of $1.20. Poor or inferior feeders cost, last fall, $3.35, and could be sold this spring for $4.80, leaving a margin of $1.45, which, you see, is a very good margin indeed. Whereas, for the very choice stuff, which cost $4.75, only $5.40 per cwt., live weight, could be secured, a margin of 65 cents, which is quite insufficient to leave a profit. This seems to work against the selection of good feeders. Wherever a man was careful to invest his money in good stuff, and gave it the best attention during the winter, he lost money; but where a poor feeder, or a man indifferent to appearances, came along and bought at the lowest prices anything he could secure, and put it in his stable to feed during the winter, he made a good profit. This seems entirely contrary to all experience and experiments in the past, but this will happen once in a while, and is due to a falling market, and the very little difference there is between butchers' meat and export cattle in the spring, when the best cattle are commanding such a very low price on the other side.

By Mr. Halliday :

Q. Where was the market for these finished inferior feeders at $4.80 ?

A. At Chicago. These prices I have quoted are Chicago prices.

Q. The best cattle at Chicago are bought at 5 cents, are they not ?

A. This year, the selling price, three weeks ago, was $5.40 for choice cattle on the Chicago market.

Q. You do not mean to say they were as inferior cattle as we have in Canada ?

A. That is the top price ; the bottom ones went at $4.80 for the worst class of stuff fed. Of course, canners and other very inferior cattle sold at lower figures.

Q. That is a better class than we have in Canada ?

A. No ; I saw that stuff.

Q. That is better than our stuff ?

A. I do not know ; we got $5.25.

Q. I am not speaking of what you got ; I am asking where the market is for these poor feeders at $4.80 ?

A. I will tell you where I got this information. Professor Mumford, in Illinois, has been carrying on experiments right along this line, and this is his data of that class of stuff. I said I had seen it. I did not see the animals ; I saw the photos which

were sent to me, and I saw the photos of the class that commanded $5.40 ; and that which cost $4.80 was pretty fat, but it would sell around here at $4.25 to $4.50 per hundred weight.

By Mr. Wilson :

Q. Why would it not be better to take our own stuff for comparison, instead of the Chicago market ?

A. We have no quotations where the classes are so distinctly marked as in Chicago. You cannot find it in Canada. If a man went to Toronto and watched the buying of individual steers for a number of days, he might possibly be able to get a detail like this, but in Chicago every day every class is differentiated, and the number of steers in each class is also given.

Q. Do they not sell them in our cities by carload lots ?

A. Yes, they do, but they do not differentiate in the classes.

By Mr. Halliday :

Q. Your statement is misleading, because I thought you were speaking of Canadian cattle.

A. I think this is quite applicable to Canada. While prices in Canada are not usually as good as in the United States, still the range is quite similar, and there has been very little difference this season.

Q. Now, you know you will not see them sold for $4.80, from the description you have given ?

A. At $4.80 for inferior cattle well fed ?

Q. Yes.

A. That is for inferior quality well fatted. I think prices were nearly the same in Canada.

Q. How low did they go ?

A. I said I thought they would go $4.25 to $4.50 here. I also said that the best stuff here sold at $5.25. Our markets here are usually lower than in Chicago.

Q. That is on account of the quality ?

A. I am not giving the reason, I am giving you the facts ; but I do not quite agree with your reason.

By Mr. Wilson :

Q. Unless you have a comparison of the value, what is the use of giving the prices? Is not that right ?

A. The $5.40 was their top price. I did not intend to say that these were Canadian markets ; but the point I was trying to bring out there was the strange fact that this past season (and the fact that it also arises occasionally in other years) it has been possible to buy the best stuff at a high price in Canada or the United tSates and sell it at nearly the same price next spring. I am sure that the honourable members who are familiar with the beef trade in this province will bear me out, that many buyers in Ontario last fall bought at $4.50 and $4.60, and sold this spring at the same price. I saw a great many lots of cattle fed under these exact conditions this year, and I also know of some in this district that bought for $3.50 and sold at $4.75 and $5, exactly the same condition of things as exists to-day in the Chicago markets. Canadian markets always resemble Chicago markets, the chief difference being that good stuff, or all classes of stuff, I might say, sell higher on the Chicago markets than in Canada. We bought for $4.75 and sold for $5.25, and we bought a very superior class of stuff.

Q. You got stuck ?

A. I think we did ; but we have to take the sweet with the bitter. Last year, we bought at $4.50 and sold for $6.20, so we made quite a profit that time.

APPENDIX No. 2

By Mr. McEwen :

Q. You balanced them up ?
A. Pretty near ; I do not know if it does quite.

By Mr. Robinson (Elgin) :

Q. These cattle that you bought at $4 and sold at $5.25, how long did you keep them ?
A. From five to six months ?
Q. Did you figure out what it cost to feed them ?
A. Yes.
Q. Do you know what they cost ?
A. Yes, I do.
Q. You had better give us these figures.
A. Well, I was going to give you that, only this discussion arose.
Q. The amount of meat you put on a beast in the winter time does not pay, unless you can get more per pound than you gave for it ?
A. You cannot begin to put on a pound of flesh for what you get for it. You improve the quality of the material that you buy, and so get a higher price for it; that is where the profit comes in.

GAINS IN WEIGHT DURING PROCESS OF FATTENING.

By Mr. Stephens :

Q. Can you tell us how many pounds these steers gained on the average in the five or six months ?
A. I am just going to give you the information on that experiment now.
As you know, we have been carrying on experiments in feeding cattle at different ages, finishing off groups at four years old, three years old, two years old, and yearlings. Of course, we did not sell the last ; they are only a year old this spring.
The cattle finished up at four years old this year weighed on the average, to begin with, 1,269 pounds, and finished at 1,553 pounds, an average gain of 284 pounds net. That was in 180 days, about six months.
The cost to produce 100 pounds of this gain was $7.05.
Now, you see where the necessity comes in of buying at a good deal lower price than you sell at, because it costs more to put on 100 pounds.

By Mr. McEwen :

Q. Does that include labour ?
A. No, that does not include labour.
Q. It does not include labour ?
A. Just the cost of feeding.
The cattle finished at three years old went in at an average of 1,079 pounds, and came out at an average of 1,377 pounds, and made an average gain of 298 pounds in the 180 days.

By the Chairman :

Q. About an equal gain with the three-year-olds ?
A. Pretty nearly. These cost $6.03 to produce 100 pounds of meat. That is about $1.00 less per hundred than the three-year-olds.

By Mr. McEwan :

Q. With the same kind of feed ?
A. Yes.

The yearlings went in weighing 965 pounds, and came out weighing 1,263 pounds, an average gain of 298 pounds, and they cost $5.54 to produce 100 pounds of gain.

By the Chairman :

Q. That is the most profitable ?
A. That is the most profitable, because we were able to sell them at the same price and the same time as the others.

By Mr. Sherritt :

Q. You were not able to buy the cattle at the same price ?
A. Yes, we got them at the same price.
Q. You could not always do that ?
A. Probably not.

By Mr. Halliday :

Q. What is the weight of the yearlings ?
A. They finish at 1,263 pounds.

By Mr. McEwen :

Q. What were they when you bought them ?
A. 965 pounds.
Q. Would they have brought as much, suppose you had not sold the whole herd together, but had sold them on their merits ?
A. Yes. I had them valued by the man who bought them, and they were worth that, with the exception of one two-year-old that was too small and would have to have been taken out. The others were quite equal to anything we had in the stable.

By Mr. Johnston (Cardwell) :

Q. It goes to prove they would be the best, as animals coming four years old grow little, and the added weight is simply fat.
A. Yes ; I have an experiment along that line.

By Mr. Richardson :

Q. In addition to the added weight, you have the increased value of the weight you put on ?
A. Yes.

By Mr. Robinson (Elgin) :

Q. These cattle were Shorthorn grades, were they ?
A. Yes. To continue, I might say the four-year-olds made daily gain at the rate of 1·58 pounds, they cost $7.05 to produce a hundred pounds and sold at $5.25 per cwt.
Three-year-olds made daily gain of 1·66 pounds. They cost $6.03 to produce a hundred pounds of gain and sold at $5.25 per cwt.
The two-year-olds gained at the rate of 1·66 pounds a day. They cost $5.54 to produce a hundred pounds of gain and sold at $5.25 per cwt.
The yearlings, that is those that started at six months gained 1·48 pounds a day. They cost $3.91 to put on a hundred pounds of gain and we did not sell them. You cannot sell that kind of stock.

SUMMARY OF EXPERIENCE IN FATTENING FOR BEEF.

Now, this is the fourth year we have carried on this experiment, and for the four years the summary is as follows: I am speaking now of the finishing age in each case.

APPENDIX No. 2

Four-year-olds have gained at the rate of 1·63 pounds a day. They have cost to produce one hundred pounds of gain $6.61 and they have had an average selling price of $5.32½ per cwt.

The three-year-olds have gained at the rate of 1·60 pounds a day. They have cost $5.91 to produce one hundred pounds of gain and have sold at an average of $5.25½ per hundred.

Two-year-olds have gained at the rate of 1·54 pounds a day. They have cost $5.24 to produce one hundred pounds of gain and sold at $5.17½.

The yearlings have gained at the rate of 1.79 pounds a day, which is the highest rate of gain. They have cose $3.27 per hundred pounds, the lowest price, and of course we have never sold them.

You will notice that the younger the animals the more economically the gain is made.

By the Chairman :

Q. All these cattle were fed on a balanced ration ?

A. Yes, as nearly balanced as we could make it. We began with a ration of rather wide nutritive ratio and gradually narrowed it. We did not feed any grain until Christmas or about then, we put the cattle in about the 15th of November and gradually worked up so that the cattle were not getting, at finishing time, over nine pounds a day. The heaviest cattle generally have got from seven to eight pounds a day at finishing-off time and the lighter cattle a less weight of meal.

By Mr. Stephens :

Q. Were they tied up or loose ?

A. We have had for four years, experiments to determine whether the cattle did better, tied or loose. Our tied cattle last year gained 1·66 pounds a day and cost $6.03 per hundred pounds of gain and sold for $5.25 a hundred.

Our loose cattle gained 1·87 pounds a day, about one-fifth of a pound more, cost $5.32 a hundred to produce gain and sold for the same price.

Then the summary for the four years is as follows :—

Tied have gained 1·625 pounds per day, while the loose have gained at the rate of 1·68, very little more, but some more, one-twentieth of a pound.

The cost has been for the tied $6.26 to produce one hundred pounds of gain, and for the loose $6.10, and they have sold at the same price.

By Mr. Ross (Victoria) :

Q. Your loose cattle were hornless ?

A. Yes, we dehorned them.

By Mr. Wilson :

Q. Did you pay the same price for the young as for the old cattle ?

A. We have this year and last year, but the year before we had to pay a little higher in proportion for the young. As a rule, it has been the same price. We have also conducted an experiment to determine, if possible, the comparative economy of giving loose steers lots of room or little room. We had one lot where each steer had 80 feet of floor space, and one where each had 40 feet. That experiment has been going on for several years. Last year, with plenty of floor space, they gained 1·87 pounds a day and cost $5.32 to produce 100 pounds of beef. The lot with small floor space, that is, 40 feet each, gained 1·52 pounds per day and cost $6.58 to produce 100 pounds.

Now, the average of the four years is somewhat different. The steers that have had large floor space gained 1·82 pounds on the average, while those that were cramped gained 1·69, nearly the same thing.

The steers that had large floor space cost $6.14 to produce 100 pounds of gain, and those in the cramped space cost $5.99, that is, for the four years.

By the Chairman :

Q. In favour of the space ?
A. In favour of the roomy quarters.

By Mr. Wilson :

Q. They did a little better when there was more room ?
A. A little better on the average.
Q. They were more comfortable, too.
A. Yes, I think they were. Last year, the steers with only 40 square feet per steer did a little better than the others.
Q. They changed it ?
A. Yes, it is not always certain. Of course, we only put in nine steers, and you will understand that, no matter how many steers there are, there is liable to be a difference in the individual. We get them as nearly uniform as possible ; but, as you know, you can take two steers looking exactly alike in the fall and put them in to feed, and one will gain 50 pounds more than the other on the same feed. You cannot overcome that, no matter how many steers you feed, although we try to overcome it by feeding as many as we can in each lot. If we were feeding only two lots of 25 each, it would make the average more nearly correct.

By the Chairman :

Q. Have you figures on grass-fed cattle ?

COST AND PROFIT IN FATTENING YOUNG STEERS.

A. No, we are unable to carry on any grass-feeding experiments at present. Two years ago, we fed a few, but I have not the figures here.

Now, as these experiments that I have already discussed indicate, it is possible to produce 100 pounds of meat of very good quality at a lower price with young steers than with old steers, and this is a fact that has been known for many years. We do not pretend to have discovered this, but there is something that may be deduced from this, that is, that there is a kind of business that can be carried on that has not been tried enough in Canada. We have been making a series of experiments to determine, if possible, the exact advantage of feeding young cattle well from the time they are born until they are ready for the export trade, or for the best beef markets of the world. We have two years' work completed and another year's half done, that is, the stock is a year old, and we are continuing this work. I have here a summary of that work. Beef that is ready for the market at two years old is generally called 'baby beef,' especially if well fed from the time the calves were born, and kept well fed until slaughtered.

By Mr. Wilson :

Q. It has not as good flavour.
A. It seems to lack flavour. I do not know if you would say it is as good, but it apparently lacks flavour ; that is our experience. Some people, you know, like butter without much flavour. So, possibly, some people would like beef without much flavour.
Q. You did not finish what you were at when I asked a question.
A. I was discussing baby beef. We have five or six steers in each lot, and I will give the average cost of feeding a steer well. Taking some sixteen or seventeen steers that we have fed, the average cost has been $29.44 for a year. To feed it as the average farmer would feed it and as we fed another lot of very decent steers, the cost has been $22.40 a year.

We charge pasture at $2 a month, and the other feeds at market prices, so you will have some idea of our method of estimating cost. The cost to produce 100 pounds of beef, when the cattle are fed a good ration from the time they are born until sold, has

been on the average $5.09 ; but where they were fed only a poor ration, it has been $5.12. That is, it really costs more to feed them badly than it does to feed them well, when the cost to produce 100 pounds is considered.

Q. How do you reconcile that with the statement you have made that the ordinary way cost $22.40 and that the good ration cost $29.44 ?

A. The animals fed on the light ration do not make the improvement the others do. The heavy ration cattle showed a daily rate of gain of 1·58 pounds, 1⅝ pounds a day, while the others gained 1⅓ pounds a day, and then again, as to the value of the beef, in the case of the well-fed steers, we were able to secure an average selling price of $5.55 per hundred pounds live weight, while for the beef from steers fed a light ration or fed in the usual way the selling price has been $4.54 per hundred pounds live weight. We sold some of the light ration beef at two years and some of it at three years. The well-fed made a profit of 46 cents on the hundred pounds of beef produced, while on the medium ration we made a loss of 58 cents a hundred. On a 1,300 pounds steer we made a profit of $6 on the well-fed ones and a loss of $7.50 on the badly-fed ones.

Q. You did not quite even it up ?

A. Better have kept the well-fed ones, you see.

By Mr. Boyd :

Q. Is it better to be out of business altogether ?

A. Than feeding the way the ordinary farmer does.

By Mr. Robinson (Elgin) :

Q. But that is only an experiment ?

A. Yes. But the balance in favour of the well-fed steers is $13.50. The average gain was 1·58 pounds a day for the well-fed steers and 1·20 pounds a day for the badly-fed animals. Now, here are some particular data of the best lots dropped in 1900. The well-fed animals were sold when they were 22 months old and the poorly-fed ones when they were exactly 36 months old. The well-fed ones weighed 1,300 pounds at 22 months old, and the poorly-fed ones 1,370 pounds when they were three years old. Now, then the selling price came out strongly in favour of the well-fed steers. For them we got $76.57, and for the badly-fed ones we got $65.00 this year. We kept them for three years and got $65; we kept the others 22 months and got $76.57.

By Mr. Boyd :

Q. Sold them on the same day ?

A. One lot was 22 months old and the other lot three years.

Q. No, I mean the same day of the month.

A. Yes, one lot sold 15th March, 1902, other lot 15th May, 1903, but if we had kept the 22 months old lot another month or so we would have got a better price. We were sorry after that we did not. They were sold for the Easter market, 1902.

By Mr. Robinson (Elgin) :

Q. One experiment was enough ?

A. This experiment is extending over five years or longer.

Q. There is no use in keeping on losing money ?

A. But some might say that these results were accidental. The cost to feed one steer of each of these lots is interesting. Those sold at twenty-two months old cost $54.28 leaving a balance of about $22 in favour of the well-fed steers. If you take away the cost of the calf, $5, bought at Ottawa, it leaves about $17 profit, labour not considered. The steers fed on a medium ration all through cost $75.80 each to feed for the three years. If we add the value of the calf to that, $5, it will make $80.80, and we sold them at $65.

By Mr. Halliday :

Q. If you sold them last year, when the prices were high, would you have got as much ?

A. I think so, had they been in selling condition. We did not try to get them in condition, but if we had, they would probably have brought as much. I saw that point, and changed the experiment this year. The steers that were dropped in 1901 were fatted off both lots this year at two years old. They were sold the same day and started the same day. The well-fed steers sold for $67.84, about $9 less than last year. The badly-fed ones sold for $47.02. The well-fed steers cost $71.85 to feed, and we sold them for $67.84. The badly-fed ones cost $43.50 to feed, and we sold them for $47. We made a profit on them and a loss on the well-fed steers.

By Mr. Wilson :

Q. That is the reverse of the year before ?

A. That is the reverse of our previous experiment. That is another example of the remark I made before, and shows that we cannot be guided by a single year's experience. Here is a case where the good stuff was sold at a loss, and on the poor stuff we made a profit.

By Mr. Halliday :

Q. You sold all at the same price ?

A. No, not those medium ones.

By Mr. Wilson :

Q. All by weight ?

A. Everything we sell by weight.

By Mr. Halliday :

Q. Then, they were not all sold at the same price.

A. I want to modify that answer 'No.' We sold all at the same price, and then they were valued by the man who bought them. He should be expected to know their value, and that was the nearest way we could come to it. He valued the best stuff at 5½ cents a pound, and the poor stuff at 4½ cents a pound, a cent a pound difference.

By Mr. Wilson :

Q. Did he give you 5½ cents a pound for all ?

A. He lumped it.

Q. How do you make that, then, if he lumped it ?

A. That is what he would have given, had he bought them separately. When he came to pay, he gave us 5¼ cents a pound all around. When he went over them to value them, he estimated the value of the well-fed steers at 5½ cents a pound, and the value of the poorly-fed ones at 4½ cents.

By Mr. Halliday :

Q. How many of the cattle had he that were worth 5½ cents ?

A. In the whole lot ?

Q. According to his valuation ?

A. About fifteen.

By Mr. Wilson :

Q. Out of how many ?

A. Out of 61 head.

Q. About one-quarter ?

A. About one-quarter. These five steers that were two years old when they were sold, every one of them was a 5½-cent animal.

By Mr. Stephens :

Q. What date did you sell these cattle ?

A. 15th May. In the other lots there were one or two year-olds, a few two-year-olds and a few three-year-olds that were worth 5½ cents ; but the average of the lots was, as I have stated, 5¼ cents a pound. He averaged them as worth the same, and paid on that basis.

By Mr. Johnston (Cardwell) :

Q. For a proper test of the worth of two-year-olds and three-year-olds, you would be compelled to have the same sires and the same dams, would you not ?

A. No, I do not see that.

Q. You cannot do it any other way, and even then it is not certain. You may get a sire from a good milk-producing strain, but poor at putting on flesh.

A. I said, a while ago, that we tried to get over that by keeping a large number of sires.

Q. But the proper test is to have ten dams and one sire, and see what ones would do at three years and two years ; that would keep the same quality of sires, would it not ?

A. Yes.

Q. And that would give you a proper test ?

A. Pretty near the same difference.

Q. No.

A. That is my experience.

Q. You can get some sires which would be splendid lookers and not much on flesh, and another which would be a good flesh-producer ; if you change the bulls on the dams, you have not a proper test.

A. You cannot take any two sires, or any two individuals, and say the results from them are really true. The best you can do is come near an average. It is an utter impossibility to say that any test or any feeding test is final. The only way is to take some hundreds of examples and say, ' That is the average.'

By Mr. Stephens :

Q. Do you buy them in quantities from one breeder ?

A. We select them generally in the one locality. We have been getting them up near Renfrew, but last year we went up near Toronto. We got a suitable lot, and it cost us more.

By Mr. Wilson :

Q. Would it not be a better test to sell them separately ?

A. Yes.

Q. The little you gain in selling them in a lot should not induce you to sell them that way, instead of separately.

A. How could you sell them separately ?

Q. Would not people buy them ?

A. Here ?

Q. Yes.

A. Separately ?

Q. Yes.

A. Well, I have tried to sell separately before now, here, and could not do it. I won't say it could not be done. Do you not think that going over them is not a good way to get at the average price ?

Q. Selling them separately is better.

A. I admit that, and I think that they should be all shipped at our own risk and an exact account kept of returns from each steer.

Q. You mean, shipped to the old country ?

A. Yes, and in that way we would get the best estimate of the value of each animal.

Q. As long as you are doing experimental work, that should be done.

A. I agree with you there. I have always felt that this putting a value on a class and on individuals by the men who buy is only an approximation.

Q. It is only his opinion ?

A. Only his opinion.

Q. But his opinion is backed up by his money ?

A. It would have been backed up by his money here : he offered to buy them.

Q. I understood you to say he would not.

A. He would have bought the best ones at 5½ cents.

Q. That is not a fair test.

A. It is not. No one would buy them separately here.

By Mr. Stephens :

Q. The local butchers would, but would not pay the price ?

A. Yes.

By Mr. Halliday :

Q. That test of cattle fed in stalls and fed loose showed that the cattle fed in stalls brought a better price.

A. But not much better, considering their age.

Q. Not much better, considering their age ?

A. No.

Q. But they were worth more money ?

A. Well, two in one bunch were inferior. You know which ones I mean.

Q. They were worth more money than those fed in stalls ?

A. On the average, you think ?

Q. Yes.

A. Well, I do not think the man who bought thought so, except in the case of two individuals. Of course, you know which two they were. Two roan animals. These two individuals really were not worth as much as the others, on the average. On the other bunch, fed with 40 feet of floor space, they were worth quite as much. Where they were fed with 80 feet of floor space, with the exception of two individuals, they were worth as much also. I may say these two were as good gainers, but not as good lookers.

By Mr. Stephens :

Q. Was there much competition—many looking at them ?

A. Yes.

By Mr. Wilson :

Q. How do you sell them; do you call for tenders ?

A. The buyers won't tender.

Q. How do you do it ? Tell us how you do it.

A. Through the year, we have many applications from men who make a business of buying steers. They sometimes write us, or they sometimes call on us, to know about our steers, how they are doing, when we will sell, where we will sell, and so on. If we chose to ask a price before we are ready to sell, some one might take it up, so we do not ask a price. But when we are ready to sell, our practice has been to write or notify the different possible buyers, and ask them to tender.

APPENDIX No. 2

Q. To about how many do you write ?

A. Last year we notified six, I think—six or seven.

Q. Is that all the prominent buyers ?

A. No, that is not all the prominent buyers ; it is about all that I know, however. I suppose there are many others, but it was all to whom I had spoken about the steers, and it was all that had come out to see the steers at the experimental farm or had mentioned anything to me about buying.

Q. You think it was pretty well known that you wanted to sell them ?

A. I do not know whether it was or not.

Q. That would make some difference ?

A. Yes ; but I know that we had buyers from Toronto, buyers from Montreal, and buyers or would-be buyers from even farther away. And we also had buyers from Ottawa.

Q. Did you put a price on, or did you make them put a price ?

A. We have asked them to tender, but it is a most difficult thing to get them to tender ; in fact, I may say, this year we did not get a tender ; last year we got two or three.

Q. I suppose your selling was just somebody coming in to buy them ?

A. That is about it.

By Mr. Robinson (Elgin) :

Q. You did not know anything about the politics of any of these men who came to buy them ?

A. No, we did not. The man who gave us the biggest price got the stuff.

By Mr. Wilson :

Q. It is a matter of business with you ?

A. Pure business. I do not care who gets the steers, so long as he has the money. I do happen to know the politics of the men who got them this year and last year ; before that I did not know.

Q. We do not want to know ; we do not care.

A. I would just say that one year it was a gentleman of one political colour, and the other year it was a buyer of the other colour ; so that, so far as politics are concerned, it was pretty evenly divided up. We do not pay any attention to that matter at all. I do not care who buys them, as long as we get the money. The man who is the best for us is the man who has the most money ; that is our idea.

By Mr. Boyd :

Q. Getting back to the question where you left it, you were telling us about two bunches of steers, where the ones that had not been fed as well as the others brought you more money.

A. No, they did not bring us more money, they brought us more profit. The line that brought $67.84 were fatted at a loss.

Q. What were the peculiar conditions of the market to bring about that result ?

A. It was a falling market. In a falling market you have to buy dear and sell cheap, and then again, there is so little difference between butcher's stuff and the best stuff, the prices that the poor stuff will bring are kept nearly uniform, and the best stuff goes down when the market falls. But the local demand seems sufficient to keep the price for the poorer class of animals fairly well up, and the local butchers do not differentiate so closely as do the foreign buyers.

Q. So that you cannot get a very satisfactory result for export cattle, except by running it over a series of years ?

A. No, that is why we continue the experiment for several years.

By Mr. Johnston (Cardwell) :

Q. How many years have you been at it now ?

A. This is the fourth year.

Q. Has it paid you ?

A. Yes. I might say this, that my data is from a series of years' experimental work. From private work and from experiments now being carried on by private individuals, I may say that there are a great many feeders in eastern Ontario who are getting in bunches of cattle, and in every case the man who is feeding cattle may make a profit this year, and he may drop some next year ; but on the average, if things go along smoothly, he will make a little bit of profit. He need not expect any fortune ; but the man who can make money now from feeding, is the man who will get out and buy a cheap steer when he can get it, who knows a really cheap steer when he sees it, and takes it in and feeds it. We have, in this part of Ontario and in the western part of the province, a great number of feeders who know good steers when they see them.

By Mr. Stephens :

Q. What you mean is, that the man who buys a good steer cheap is the man who will make money ?

A. Yes, he makes the money ; it is a grab game.

GRASS-FED BEEF.

By Mr. Sherritt :

Q. When you make your test of stock and your estimate of the cost of keeping it for the year, $2 per month is what you count for the grass ?

A. Yes.

By the Chairman :

Q. I was going to make the remark, that for years our average three-year-olds in the west have weighed 1,500 pounds, and we never fed them any grain ; but of course we did not get the same price that you got in the east. If we did, we would make a great deal of money.

By Mr. Wilson :

Q. How does it compare with the grain-fed beef ?

The CHAIRMAN.—It is first-class beef, better than you get here, in Ottawa.

By Mr. Wilson :

Q. Will Mr. Grisdale tell us the difference in quality between the western beef and that which has been fed on grain ?

A. One great difference is, that the grass-fed beef does not reach the other side in as good form.

Q. How is it for flavour ?

A. I think the flavour is all right. As far as I know, it is, in this country anyway ; but over on the other side of the water, I visited the stockyards in London and Glasgow, and the great fault they found with the western beef was, that it was in pretty bad shape when it got there, and had not long enough time to stay in that country to recuperate before being slaughtered.

By Mr. Richardson :

Q. Is not $2 per month a rather high rate for grass feed ?

A. Not on good farm land.

APPENDIX No. 2

By Mr. Wilson :

Q. Anywhere in the city or town, that is the ordinary rate ?
A. That is the ordinary rate around here.

By Mr. Stephens :

Q. How many acres of grass land do you allow for a three-year-old steer ?
A. We have not fed any of that age. But we usually allow one or one and a half acres to a two-year-old. Of course, it will depend on the kind of season ; with such a season as we have had this year in the early part, it needs a good deal more.

By Mr. Erb :

Q. Have you the figures to show whether the fattening operations have been profitable, the total cost of the animals you bought, and the cost of feeding ?
A. Of the whole thing, this year ?
Q. Yes.
A. No, I have not.
Q. That would show whether your whole feeding operations have been carried on at a loss or at a profit.
A. I can tell you whether they were or not : they were not, this year.
Q. If a farmer kept books and saw that he was carrying it on at a loss, he might go out of the cattle-feeding business.
A. If you go through Ontario to-day, you will find that 80 per cent of the farmers who fed cattle this year have done so at a loss.
Q. You would not ask the farmers to go out of business because of that ?
A. No, because this has been an exceptional year. Last year, there was not 10 per cent who did not make a good profit.

By Mr. McEwen :

Q. If he did not make a profit on the sale, he has the manure left.
A. Yes, he has all the residue.
Q. In order to keep up the farm, he must do it.
A. Yes.

By Mr. Stephens :

Q. It all depends upon the price of feed and the price of the markets ?
A. Yes. Now, last year, undoubtedly, almost every farmer made a very good profit; we made something : about $10 a steer it figured out last year, big, little and indifferent, on every animal we sold. We had 90 cattle, and we cleared about $10 per steer. That is a fair profit. We are not going to lose that much this year, but we are going to lose something.
Q. Do not figure that out ; it is not pleasant.
A. I have not had time to figure that out yet, and I agree that it will not be pleasant to do so.
I have the cost of feeding each bunch, if that would be any use to you. The cost of feeding the three-year-old steers, nine of them, was $180.69.

By Mr. Boyd :

Q. I hear a great many ask if it is most profitable to put a steer off at two years old or three years old ?
A. The two-year-olds are much more profitable, if well fed ; of course, you cannot do it on grass alone.

By Mr. Johnston (Cardwell) :

Q. We can get a calf a year old, 1,000 to 1,200 pounds in weight, but we never can make him gain more than 500 or 600 pounds in another year.

A. And you would have to feed very well to do that.

Q. A calf that would weigh 1,200 at twelve months old does well to be 1,700 at two years old. And the next year he will gain less, and the next year he will gain less still.

A. Therefore, it stands to reason that it will be profitable to feed them off as early as you can ; it will pay to have the beeves off at an early age. If you have any further questions to ask or any point to take up in connection with this beef question, I have still a few minutes.

HOGS,—BREEDS.—TRIAL RATIONS IN FEEDING FOR PORK.

I might just say that we have only four breeds of pigs at the farm, Yorkshires, Berkshires, Tamworths and Large Blacks, which were imported two years ago—to be exact, in September, 1901—to determine, if possible, whether they would make a good breed for this country or not. I must say that up to date the results have not been very satisfactory. They are good feeders, thrifty and healthy, and fairly rapid growers, but they have a little too much development of belly meat, and are a little too thick and wedge-shaped over the shoulder, that is, they get thick on top, and this thick fat, which is right between the shoulders, when the carcass is cut down the back, falls rapidly away, in the same way as does the fat on the 'razor back,' and, therefore, this carcass is objectionable for bacon. We have tried their crosses with the Berkshire, the Tamworth and the Yorkshire, and the crosses did not have this peculiarity so distinctly marked. Probably the crosses are more thrifty than the pure-breds of any of the breeds named, but of course that is a peculiarity of cross-bred animals. We get more hardiness and thrift in cross-bred pigs. They are always thriftier and hardier than the pure-breds.

We fed ten pigs, pure-breds and crosses, on oats, peas and barley, with a little skim milk, and we found that the Large Blacks and their crosses gained quite as rapidly and as economically as did any of the other breeds. Therefore, the only objections to them are these two peculiarities mentioned, the razor-back shoulder and a rather too great development of belly meat, which is cheaper than the other cuts.

We have been paying a good deal of attention recently to the production of bacon with green feeds and roots. I do not intend to give you the details, but simply a summary of our experiments.

Q. Before you go to the feeds, have you experimented on what pure-bred pigs do best at certain ages, say Berks and Yorkshires up to six months, and which of them is the most profitable ?

A. Yes. We have fed them, and so far as all our experiments go, there is very little difference in the cost of producing a pound of gain in any one of the breeds.

Q. At six months each ?

A. At six or eight months, when weighing 180 to 200 pounds.

Q. Did you find one taking a good deal more food than the other ?

A. No.

Q. Did you find much difference between the Berkshires and Yorkshires in the amount of food they will consume ?

A. Not for 100 pounds of gain.

Q. Up to six months ?

A. Up to six or eight months.

By the Chairman :

Q. How is it after that ?

A. We do not usually feed after six or eight months, because they are then up to the weight required by the market.

APPENDIX No. 2

By Mr. Boyd :

Q. Are the Tamworths included ?
A. Yes.

By Mr. Johnston (Cardwell) :

Q. I have found that a Berkshire of six months old weighs, say, 120 pounds ; a Yorkshire may go 120 pounds also, keeping pretty near apace to that age, but after that the Yorkshire will gain more rapidly, but they will have had two dollars' worth more feed.

A. I understand. We have not done anything like that. You mean, to determine the cost at different ages. I do not think there has been anything done along that line in Canada, and that would be an interesting experiment.

Q. Feeding with peas and oats, equal parts, giving each of them all they want, the Yorkshire will have consumed from $1.50 to $2 more at 126 or 127 pounds than the Berkshire ?

A. I am not prepared either to support or differ with your data, because I have not the material. I have not tried anything like that.

By Mr. Boyd :

Q. I think the Tamworth will eat more than either of them ?
A. We have tried feeding right up to their finishing rates.

By Mr. Johnston (Cardwell) :

Q. In country places where they feed different breeds of hogs, you will sometimes hear farmers say : 'My Berkshire brought so much, and my Yorkshire so much.' That is not data as to who gains the most money ?

A. No.

Q. We would like to know exactly how much more one eats than the other ?

A. Our experiments go to show that when you finish them off, there is very little difference in the breeds.

By Mr. Richardson :

Q. From what country do you import the Large Blacks ?
A. From England.
Q. You have not finished the experiment of crossing them with the other breeds ?

A. Yes. We have finished the crossing, but we have not finished with breeding pure. We do not think it necessary to continue with crossing, because every cross-bred so far has been successful, but with the pure-breds we have had only one or two lots, and we do not like to end up without sufficient data. We are feeding 28 of them now, and when these are fed off, we will have some better information.

By Mr. Boyd :

Q. How are you feeding them, in pairs ?

A. No, we are feeding them on grass, in two lots. When they get up to weight, about 120 pounds, we will put them off in small groups ; but until they are older there is not much advantage in feeding them apart.

By Mr. McEwen :

Q. Are you feeding them something else besides the grass ?
A. Sifted oats and barley, mixed.

By Mr. Holmes :

Q. What is your experience with corn in feeding ?

A. It is a good food, especially if fed in conjunction with other foods. The ration of cornmeal and milk is a capital ration, a good ration for bacon and a good ration for

a growing pig, and if to that you add a small amount of green feed, the conditions are nearly ideal. We do not like to have cornmeal fed without milk, however, except in small proportions, because the results are not good.

By the Chairman :

Q. It produces soft pork ?
A. Yes, soft pork.

By Mr. Sherritt :

Q. Do you feed roots in winter ?

A. Yes, we feed turnips to breeding sows and also to young stock. We have carried on experiments in feeding roots in winter, and are now carrying on an experiment to determine, if possible, the exact proportion of roots best suited to make the biggest and most economical gains, the best gains of meat. We have one lot getting an ideal grain ration of oats, peas, barley, in equal parts, and skim milk, 4 pounds a day.

The next lot gets barley meal. They did get shorts as well, but now they are getting barley meal and half as much, by weight, of green feed.

The third lot gets barley meal, as much as they will eat up clean, and three-quarters as much, by weight, of green feed.

Q. What do you mean by green feed ?
A. At present it is oats and peas ; but as soon as we get the rape, it will be rape.

By Mr. Ross (Victoria) :

Q. Do you grind the barley and oats ?
A. Yes.
Q. It is all ground ?
A. Yes. The fourth lot get equal weights of meal and green feed.
The fifth lot get 1½ pounds of green feed for a pound of meal.
The sixth lot get two pounds of green feed for a pound of meal.
The seventh lot get three pounds of green feed for a pound of meal.
The eighth lot get four pounds of green feed for a pound of meal.
The ninth lot get five pounds of green feed for a pound of meal.

We feed so that they will eat up the green feed or roots clean, and supposing we were giving the ninth batch three pounds of meal a day we would give them fifteen pounds of green feed or roots. If they did not eat up the green feed we would reduce the green feed three and a half or four pounds and reduce the grain proportionately.

By Mr. Boyd :

Q. Do you feed the meal dry ?

A. No, we wet it in order to keep them from scattering it around on the ground. We believe in feeding dry, however, under most conditions.

Q. Have you none of these automatic feeders ?
A. Yes, but we feed all our meal ground.
Q. But have you not one of these ?
A. Yes, we have an automatic feeder.
Q. Have you tried the feeder ?
A. Yes, it has proven very satisfactory.
Q. The feed is not scattered all about ?
A. Not very much.

By Mr. Robinson (Elgin) :

Q. Do you weigh the grain fed ?

A. Yes, it is all weighed. The lots that get only a small proportion of green feed are fed it at twice a day, the lots that get a large proportion are fed it at three times a day.

Q. That must involve a great amount of work ?

A. Yes. In the case of these experiments you cannot use the automatic feeder you see because you could not compel them to eat green feed while using the automatic feeder. You could not tell how much they got. You cannot compel them to eat a certain proportion and we have to weigh the food in order to do that. We have a lot going on to the automatic feeder on a pasture shortly, they are not being so fed already because they are not old enough to take it that way. Last year we had a lot of it, and the year before.

By Mr. Sherritt :

Q. Would they not gain more if they were on it than when they are forced to it ?

A. Yes, some would, but what I want to determine is what is the most profitable proportions in which these foods may be fed. Up to date one of meal and three of grain feed is the best, the most economical. If you get past that then it is beginning to cost more because you have to value the green feed, as well as the meal.

By Mr. Stephens :

Q. At what age do you make hogs weigh an average of 200 pounds.

A. About seven months, sometimes a little under if they are rushed. We have had them go 200 pounds under six months but the meat is not usually of good quality. Rushed bacon is not good quality, according to our experience.

By Mr. Sherritt :

Q. Is it cheaper ?

A. Yes, it is cheaper. Just to show the gains that may be made from pigs fed on roots and the advantage of it, I have here a summary of an experiment showing that to produce 100 pounds of pork only 269 pounds of meal were required in addition to roots. The average amount of meal required to produce 100 pounds pork live weight is 425 pounds, you see, therefore, that the roots saved 156 pounds of meal, on each 100 pounds of pork and 2,100 pounds of meal saved by 3-10ths of an acre of roots. Many other lots were fed similarly with similar results, in 1902.

HOW TO GROW RAPE.

By Mr. Stephens :

Q. When do you sow rape, in the spring ?

A. As early as April if the conditions are favourable, and as late as the 20th or even the 22nd of August. Last year we sowed ½ acre on the 22nd of August and by the 20th of September we turned in 30 pigs and they were unable to keep it down. They were summer pigs, July pigs, so you see it is a rapid grower and is valuable on account of the amount of pork it produces.

Q. Did you ever try growing any in between the corn rows ?

A. We have tried but not with great success. The shade keeps it from making a strong growth and the machine cutting the corn and the wagons going over leave it in bad shape after the corn is cut. We also tried it with grain, and the objection there was that it grew with the grain and when the grain was harvested we found more or less of it in the sheaves and it prevented the grain from drying out quickly.

Q. Did you drill it or broadcast it mostly ?

A. We drilled it when it was sown by itself and broadcasted it in the grain. We have just got out a bulletin on the Culture and Use of the Rape Plant.

By Mr. Sherritt :

Q. Sometimes it will grow up without a stem.

A. It is rather unsatisfactory when sown with grain. We recommend sowing it in drills 22 inches apart, just wide enough to get a horse cultivator through, because it is

well to cultivate it once or twice. You will then get a greater amount of feed from an acre of the crop than where it is grown without cultivation. It will grow on any kind of land in wet weather. The present weather is just the sort for it. We sowed some on April 25, and it is coming up now. So you see, it is of small value in dry weather.

By Mr. Stephens :

Q. How many pounds to the acre do you sow ?

A. We sow 3 pounds to the acre when in drills, and 4½ pounds when it is sown broadcast. If it is intended to be cut and fed to cattle in another inclosure, probably broadcast seeding is best, if your land is clean. If the land is dirty, or if you intend pasturing it, sowing in drills is best. If it is pigs you turn on to it, they will walk up and down between the drills without injuring them.

By Mr. Sherritt :

Q. You use it for sheep, too ?

A. Yes, sheep and cattle. We fed some of those steers we had to summer last year, some yearlings, on it.

By Mr. Stephens :

Q. Did you cut it ?

A. Part we cut, and part we let them use as pasture. It is more economical to cut it, but of course, it takes time to do that.

Q. Did you ever lose any cattle from feeding them on it ?

A. No. We lost a sheep once.

Q. You do not let them go at it too eagerly at first ?

A. You have to be careful with all ruminants to see that they do not go on rape hungry or when it is wet. You have to give them a full feed of something before turning them on it, and then be careful not to let them on at any time when they are very hungry or when it is wet.

By Mr. Sherritt :

Q. That is, cattle ?

A. Or sheep. With pigs there is no danger.

Q. I find sheep do not take hold of it at first.

A. Sheep are very careful of anything new. We turned some on lucerne on Saturday, and they would not take it. Pigs on rape do not show any desire to eat it : you have to force them to eat it by practically starving them for a day or two, and then they will eat it quite heartily.

That, gentlemen, I think, is all I have to say, and I must thank you for your courteous attention.

Having read over the preceding transcript of my evidence of June 19 and 24, I find the same to be correct.

J. H. GRISDALE,

Agriculturist, Central Experimental Farm.

PROTECTION OF TIMBER LANDS, RESERVATIONS

COMMITTEE ROOM 62,
HOUSE OF COMMONS,
FRIDAY, March 27, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock a.m., Mr. Douglas, chairman, presiding.

Mr. Elihu Stewart, Superintendent of Forestry, in the Department of the Interior, was present by request of the Committee, and made the following statement :—

Mr. Chairman and Gentlemen of the Committee, I thank you for giving me an opportunity at this early stage of the proceedings of giving a brief outline of what has been done in the last two years—for it is two years since I addressed the Committee before—in the Forestry division. When I was here two years ago I said that we had decided on certain lines of work, first with reference to forest protection, and second with reference to encouraging forest tree planting on the bare prairie. Since then these have been developed so far as the limited appropriation placed at our disposal will permit. In order to be as brief as possible, I will endeavour not to repeat what is in my official report.

PROTECTION OF FORESTS FROM FIRE.

I will first say a few words on forest protection. In starting this work, I looked over and examined as far as I could the different systems of forest protection in the different countries where a forestry bureau or a forest protection system was in existence. I also examined the patrol system in force in Ontario and Quebec, and other provinces as well. In a country so large as the Dominion (because I want to call your attention, gentlemen, to the fact that as far as that is concerned) we have forests of timber to look after in all parts of the Dominion, except the older provinces. That is a large area ; indeed as I stated before the Committee two years ago, larger than all the older provinces. This embraces the forests in the Territories and Manitoba, as well as the railway belt in British Columbia.

By Mr. Ross (S. Ontario) :

Q. Have you examined all the timber belt in the far north ?

A. Not as far north as timber extends ; indeed I did not think that of as much importance as to endeavour to inaugurate some system of protection against forest fires, because that is the most important thing, that was something that demanded immediate attention considering the enormous loss and waste of timber which occurs from this cause.

SYSTEM ARRANGED FOR PROTECTION OF CANADIAN FORESTS.

I set about at once to devise some means of mitigating the great destruction from that cause, and I have devised the system set out in the first report I made

to the department in 1900, which I am not going over now. Suffice it to say that we have employed forest fire rangers, and these are not employed, necessarily as in Ontario, for the whole season, but under some official of the government and to be called out when necessary. The first season after I took charge, viz., 1900, we had these men ready, but it was a wet season in British Columbia and the North-west Territories and we did not need to employ them or expend any money for that purpose. Both last year and this year were very dry in British Columbia, and destructive fires occurred there, as well as in Washington Territory across the line, and an enormous amount of timber was destroyed, especially in Oregon and Washington this last season and the year before as well. Outside the railway belt in British Columbia very destructive fires occurred. This railway belt is 40 miles in width, 20 miles each side of the railway line of the Canadian Pacific, over which the Dominion has control and which we have to patrol. Last year and the year before were extremely dry in this district.

Any one who has seen the reports in the newspapers last fall will know what an amount of damage was done in the Pacific Coast States. Here is one paper published in Washington Territory in which, as you see, they have a heading across the whole page, 'Dark as Midnight.' It was estimated that 5,000,000,000 feet of timber were destroyed. That would be, at $1 per thousand, $5,000,000. Here is another report right across the boundary from our territory of a forest fire where mills and farm buildings were burned and much damage done. It goes on to say that the damage was $10,000 in one place, $15,000 in another place and so on.

Therefore, this year and the year before as well, it was necessary for to employ the services of fire rangers for several months continuously. The result was that we lost no timber on that account. I have the report of last year not only in the railway belt, but in the Washington and in the Kootenay region where there was great destruction, while, as I say, in the railway belt we lost no timber of value. I will give you the number we have employed—I am speaking only of British Columbia now ; we have also Manitoba and the Territories to look after. The number employed in 1902 in the Railway Belt under Mr. James Leamy, Crown timber agent at New Westminster, who has charge of that district, was eight fire rangers.

The belt is divided into eight districts over each of which was one man. Each man has general instructions of what he is to do. He takes these notices which we have had prepared and posts them up and down the trails or travelled routes, because people do not travel all over the country in the west as they do here, but keep to the regular routes. We have to work under three different fire laws, the North-west Territories ordinances, the Manitoba Fire Act, and the British Columbia Fire Act, and we have to have these three different fire Acts published. These rangers have these copies of the fire notices and copies of the Fire Act applicable to their particular district ; they wear badges ; they go up and down these trails, taking the names of every one travelling on them, informing them of the provisions of the Fire Act, and warning them to be careful in lighting their camp fires and seeing that they are put out when they leave camp. These men, in case of fire, have power themselves to engage others, to call in assistants, where absolutely necessary, and on the certificate of this agent and also the certificate of his supervising officer, they are paid, but there was a very small amount expended in this way last year less than the year before.

FIRE GUARDS.

In the Territories the number of fire rangers employed last year was six, and in Manitoba eight. In all there were only 22, but, in addition to that, there have been some fire guards built. Now, fire guards are useful in some cases, but not very much as a general rule. We, however, built a fire guard south of Banff, about four miles south of the Banff Hotel, just beyond the limit where lumbering operations were going on. The country was left in a very bad state by the lumbermen, and we built a fire guard

down from the mountains on each side of the Spray river. The guard was 100 feet wide and was built at a very small cost. It will form a basis from which the patrolmen can look after fires that may start in the district south.

By Mr. Ross (Ontario) :

Q. What is a fire guard ?

A. A fire guard is made by clearing the timber off the ground and burning it, and in some cases by ditching and ploughing the ground, but in this case we could not plough it on account of it being on the mountain.

We have also a fire guard west of the Turtle mountains. These are the notices that are posted to warn people against the danger from fires. There were 8,790, I think that was the actual number, posted up in all that country last year. Now, it would be impossible for the fire rangers to get over all the country where these were posted last year. In going through the country last season, I noticed these notices were posted up in every quarter in advance of me. I went on the Peace river down to the Mission there, and was introduced to the priest, who did not speak very good English, but he went out and pointed to one of these notices. The way this was done in those outlying, wilderness regions was through the Hudson Bay Company, who very kindly undertook to do the work all over their north country. They send up the notices to their agents, who post them up all over their districts, and the Committee may readily understand, it would have cost the department a great deal to send men out and post them up. In addition to that, we utilize the Canadian Pacific Railway and the Canadian Northern Railway. The officials of these companies were kind enough to undertake to post the notices up all along their lines, and by that means, at no cost at all to the department we get them distributed not only along the main lines of these railways, but along their branch lines as well. The North-west Mounted Police and the Indian agents also distribute a number of these notices.

By Mr. Ross (Ontario) :

Q. Did you say there were no extensive fires through British Columbia last year ?

A. There were very extensive fires in British Columbia last year, but outside of this railway belt.

Q. They were outside the belt 40 miles wide, that you spoke of ?

A. Yes. The fires were very extensive down in the Kootenay district I know, and the commissioner of lands and works in British Columbia has asked me since to try and assist him in getting up some sort of fire service for the province. I think it is very important that the province should provide some sort of service there to prevent fires, for they have an enormous quantity of timber which is very rapidly coming into demand, and bringing a much larger figure than it has ever done before.

TIMBER RESERVES DEFINED.

There is another matter connected with the Forestry office, and in every country where there is a forestry service it is observed, and that is the looking out for and setting aside of timber reserves. There is a work I would like to undertake, if our means would permit it, and that is of exploring the wooded country in advance of surveys. I do not care whether the Forestry branch should undertake it, or whether the Surveys branch should do it, but certainly there ought to be something done in that direction as far as practicable at once. That is to have explorers sent out in advance of the surveys—(it would save the expense of surveys sometimes)—to designate what portions of country can be better and more profitably left in forest, and what may be better left open for agricultural settlement. In the North-west Territories, in Manitoba and British Columbia there are certain districts at the head waters of streams where it is necessary for the forest to be left. Take, for instance, the Riding and Duck mountains in Manitoba. We have a reserve there, made a good many years ago, at the

head waters of a large number of the streams flowing into the Assiniboine, such as the Little Saskatchewan, the Shell river, &c. All the water in fact in the north-western part of the province of Manitoba is dependent on that watershed for its supply. As you will see by the map, we have here set aside this territory ; this is the Riding and this is the Duck mountain, and these are the Porcupine hills. If you denude this territory of timber, you destroy that part of Manitoba. In the State of New York they are now buying back from individuals a large territory there at the head waters of the Mohawk and Hudson rivers, just in order to return a water supply for these streams.

Q. You say that you reserved this territory from homesteading ?

A. Yes, it is reserved from homesteading.

Q. Is there any natural growth of timber on it ?

A. Yes.

Q. What kind of timber ?

A. There is poplar, spruce and birch.

Q. Are they good sized ? They are not like Ontario timbers ?

A. There is some good timber, but not as large ?

By Mr. Hughes (Victoria) :

Q. There are spruce, 4 feet through there, are there not ?

A. Yes ; there might be an exceptional one that size, but generally the timber is smaller than in our Ontario lumber woods.

By Mr. Ross (Ontario) :

Q. In Ontario we do not call poplar, timber at all.

By Mr. Hughes (Victoria) :

Q. There is a lot of poplar timber up there 20 inches through.

A. Yes, more particularly in the north. But it is not for the timber alone that the reserves are set aside. On a lot of this land is scrub, and not timber at all, but the scrub will preserve and hold back the water supply and create a reservoir.

By Mr. Cochrane :

Q. Is that portion reserved from homestead only ?

A. Yes.

Q. Does not the government sell timber off that ?

A. No, there has been none sold on the reserves since I had charge of it, but there may have been timber on it sold a good many years ago. But since it has been set apart as a forest reserve permanently, there has been none sold.

By Mr. Hughes (Victoria) :

Q. It may as well be understood that there is no timber there to sell fit for market purposes any longer.

By Mr. Henderson :

Q. I notice all over this region that the farm buildings were very much superior to those in any other part of Manitoba. Did they get the timber for that purpose from that region ?

A. Yes, from the Riding and Duck mountains. The forest reserves are very important, not only for the timber you get, but for climatic reasons as well.

There is another reserve which is coloured green here on the map at the foot hills of the Rocky mountains on the Bow river, which has also been set aside. The reason for setting that aside is this: As you are aware, the Dominion government, or really the North-west Territorial government, and certain companies are building irrigation ditches and canals through that country, going all the way down to the Saskatchewan, for the

purpose of irrigating that whole district. It is therefore absolutely necessary to maintain that forest there to preserve the water supply, otherwise the irrigation ditches will be of no use ; there would be a flood of water in the spring and a drouth in the summer. I say then there are districts which form the natural watersheds, where it certainly would be better that the country should be left in timber rather than used for agriculture, and that is a matter which I think demands greater attention than it has received heretofore. Why I could point to many places even the provinces of Ontario and Quebec where there is township after township that would be worth a great deal more indeed if left for timber and which in fact should never have been surveyed for settlers.

These would have been worth more for timber and would be more valuable in the future even than at present, and should have been kept for that purpose.

SPECIAL TIMBER AND PARK RESERVES.

In the new districts I would even go so far as to insert in every patent for land in timber districts, that a certain percentage, say 10 acres in a 100 or something like that, be left in forest. I think this is a matter which deserves attention.

During the last year, perhaps I am not exactly correct in saying the last year, but about that time, the park at Banff, the national park, the Rocky mountains park, has been enlarged, very much enlarged, so that it now includes about 2,850,000 acres, an area equivalent to about 125 townships. Another reserve known as Yoho park, adjoining the Rocky mountains park, has been set aside, the area of this is about 535,000 acres.

By Mr. Hughes (Victoria) :

Q. Are these districts reserved for mining purposes too ?

A. No, I do not think so.

Q. Mining is allowed in them.

A. At present I think so. There is nothing but a departmental order governing them. That is another matter that will have to be taken up, and some of these reserves should be set aside by Act of Parliament. However, these are just departmental orders, and prevent the homesteading or selling of land in them.

By Mr. Wilson :

Q. Is there any of this land fit for homesteading ?

A. I should think there would be. I think the Yoho park contains some good land near the Columbia river. However, it was just taken in the meantime and it is easier to take it out than to take it in after homesteaders have gone in on it.

Last summer when I was in British Columbia at Kamloops, a sub Crown timber agent asked to take a trip out south of the village of Kamloops to see an elevated country there, and the result of it was that I advised that an area of over three townships there should be set aside as a forest reserve. The reason for this was similar to that in the case of the Riding mountain, that is for the water supply. Those of you who know British Columbia, know that there is what is known there as a dry belt, where irrigation is necessary. Kamloops is in this area. This is an elevated tract unfit for agriculture, but having some timber and quite a number of lakes, and it is the source of a considerable water supply that should be preserved for irrigation purposes, and it has been set aside for that purpose.

By Mr. Cochrane :

Q. Does that portion belong to British Columbia or to the Dominion government ?

A. All this belongs to the Dominion government. It was given by the British Columbia government as their contribution for the building of the Canadian Pacific Railway. The railway belt, as it is called, is about 40 miles wide by about 500 long.

By Mr. Hughes (Victoria) :

Q. What kind of trees are you going to plant.

A. We are not proposing to plant any ; there is a natural growth there that should be kept from destruction by fire. The growth is similar to that in that district, the bull pine, and a lot of scrub.

Q. You only want the timber reserved as a water supply ?

A. That is the idea. I do not think there is any very large quantity of valuable timber, but it is at a very high elevation, some 6,000 feet, and it is useless for anything else, but no doubt people would come and settle there, for people will settle in places where they cannot make a living, and it is better to reserve it.

By Mr. Wilson :

Q. Have these reserves been explored by any person ?

A. Which ones ?

Q. The whole of them ?

A. They have been explored. The Riding mountains reserve has been partly surveyed.

Q. Has there been a report of that printed ?

A. I do not know of any printed report, of anything definite being printed, except the reports of the surveyors.

Q. There must be a large amount which has never been examined ?

A. They have been blocked out, most of them, although not in British Columbia.

Q. The National park has never been surveyed ?

A. You mean the Rocky mountains park.

Q. Yes, at Banff ?

A. I think the limits of the old park were surveyed ; this large new addition to it has not.

Q. Not with a view of having settlers go in and settle ?

A. No, I do not think so ; it is too high.

MR. MCPHERSON.—How can you settle where there is 40 feet of snow ?

MR. WILSON.—I presume there is not often 40 feet of snow.

TIMBER RESERVATIONS IN THE MOUNTAINS.

THE WITNESS.—I would like to mention a matter that was drawn to my attention recently in British Columbia by Mr. Leamy, who has done very excellent service there, indeed, more than is generally known in keeping fire out of that district. I refer to the young growth of timber that is coming up in the mountains that would be of very great value in future years. He proposed (and I intend to have his suggestions carried out) to set a number of these aside for timber purposes. We will have to have them explored first. There is not much that is valuable for timber at present, but there is a young growth coming up that we will endeavour to keep by setting these areas apart as forest reserves. There may be a number of them.

Now, if there is anything else regarding this matter of natural forest management about which any one would like to ask a question, I will be glad to answer it before passing to another matter, that is with reference to tree planting on the plains.

By Mr. Ross (Victoria) :

Q. Do you think you have got enough help to control the fires on these mountain sides in British Columbia.

A. We have not enough, we have not all we should have. Our funds have been so limited we have been compelled to economise as much as possible.

By Mr. Broder :

Q. In case of emergency you have power to call on more help ?

A. Yes.

APPENDIX No. 2

By the Chairman :

Q. In reference to Moose mountain, you have a fire guard ; what means have you used to preserve the fire guard. Where it is cut away first, and ploughed out, there is a young growth shooting up every year, and in two or three years the fire guard is practically useless.

A. That fire guard was started before I undertook this work. It was an arrangement with the North-west Territorial government. They agreed to build a fire guard around the limit. That is another timber reserve I forgot to mention. They were to build the guard on condition that the Dominion government should build a road through the mountain to give ingress and egress. At points there are roads there already, and it is difficult to get people where there is a trail, no matter how bad it may be, to leave the trail and travel on a new cut road, and so far in this case they have not done so.

By Mr. Broder :

Q. They prefer their own trail ?

A. They like their own trail better even though it is not as good as the other at all times of the year.

By Mr. Hughes (Victoria) :

Q. I was going to draw attention to this aspect of the case. In the southern part in South Alberta and Saskatchewan the people all want a system of fire protection, but in North Saskatchewan and North Alberta they are praying for fires to sweep the country ?

A. Yes.

Q. To sweep the country. If you step into one of these north-west regions where the poplar grows five or six inches thick and one to every square foot, you will see that it is a formidable proposition to clear the land. I heard a good many prayers for a fire to come along and do the work. Have you given any consideration to the advisability of having fires in some places and the non-advisability of having fires in other places ?

A. It is very difficult, as you know, to frame any law that will not operate against some people. There is the Fire Act, which you will see is different in the Territories and Manitoba to what it is elsewhere.

By Mr. Broder :

Q. It would be a difficult matter to control fire with settlers in the country.

A. It is difficult, but I have the Acts of the provinces here, and the Act of the Territories.

Q. The regulations state it ?

A. Yes, the regulations state it.

By the Chairman :

Q. I might say to the Committee that the Mounted Police render most effective service in regard to fires. If there is a fire to be seen within twenty miles of where they are, they are on the ground to render assistance as speedily as they can get there.

A. That is true; the Mounted Police are of great assistance, but we must remember that their duties are confined largely to the plains region and not so much to the forests, and as our work is in the forests—though we do some plains duty as well—it is necessary to have these forest fire rangers.

FOREST TREE PLANTING ON THE PLAINS.

If you allow me, now, I will take up the other part of the subject, because I hope to get through to-day, the encouragement of tree planting on the plains. The co-

operative system I inaugurated some two years ago is detailed in Circular 3, of which I have copies here, but which I need not read, as it appears in my reports. I will not go over it, but in trying to work out some system by which we could assist in the growth of trees on the prairies, we had to look over a very large territory. Trees that would grow in Manitoba, even at Indian Head and in Assiniboia, would not be successful in south-western Alberta and other parts, so that in framing a system we had to have is pretty elastic. I got out this system after searching those of the United States and Europe as well, and the result is that we have one which I think those who know anything of its working will admit is proving successful. The system is one of co-operation. Any farmer in the country wishing to lay out a forest plantation or a wind-break, around his buildings more especially, sends notice to the forestry branch here, giving notice within a certain time. These applications for the co-operation of the government in the planting and cultivation of a permanent forest plantation or shelter belt, state the township, range, number of the lot on which the plantation is proposed to be made, the nature of the soil and how cultivated, the nearest railway station and express office, and the distance thereto, and the post office address. On receipt these are filed, tabulated, and arranged in the spring, as soon as the roads are fit for travel, we send out experts to examine the land and advise the parties what steps to take and how to plant. He will confer with the applicant while there and arrange for the location of the plantation or wind-break, advising the applicant as to the preparation of the soil, the varieties of trees to be grown, the proper system of planting, and other details. After that a sketch plan will be prepared for the use of the applicant, showing how the trees are to be planted.

By Mr. Wilson :

Q. Where is the sketch made ?

A. In the office here from data got there. We do not make the sketch there, but the agent of the forestry branch gets the data and sends it down here.

Q. Do you send a man to inspect for every application ?

A. Wherever we can.

Q. That must cost a good deal of money ?

A. As I say, these applications are tabulated. Our men go around, taking all the farmers in one neighbourhood once a year.

Q. I think it was said last year that they went and inspected after the trees have been planted, to see if the people were taking proper care of them.

A. The inspectors go around every year and not only inspect the new land, but look after those that have been planted before.

By Mr. Hughes (Victoria) :

Q. Have the government anything to do with supplying trees ; why should the government meddle in a matter like that ?

A. That is an important point. The question whether the government were exceeding what they should do in assisting in planting trees in this way is one that was spoken of before. Heretofore the Experimental Farms were sending out trees wherever they were asked. These were sent to the parties who very often had no knowledge of the proper soils for different varieties of trees and no knowledge how they should be planted or cared for. The result was that in getting the trees they asked for they often got trees unsuited to the soil or climate of their particular district. They were planted without supervision, perhaps not at the time they should be, not watched properly, and the result was not as satisfactory as was desired. We decided that if we were to send experts out we should see that the work was done properly. The trees are got from the experimental farms at Brandon and Indian Head, where we have a man at each place looking after the nurseries. There are about 15 acres at Indian Head set aside for this purpose, and a somewhat smaller area at Brandon.

APPENDIX No. 2

By Mr. Cochrane :

Q. These gentlemen who have control of these farms know the kinds of trees adapted to the country ?

A. We know the kind of trees they grow. You say, do they know ?

Q. The officials at the experimental farms, do they not know without information from the men outside, what trees are adapted to the soil and climate of any particular section ?

A. I do not see how they could know. A man at the farm, if he does not go out to see the land, will not know.

Q. But they are there long enough to know without going up ?

A. No person is as willing to admit the utility of our work as the officers of the farms are. Mr. Bedford stated at a meeting at Winnipeg that inspection was necessary. He spoke of the necessity of going out and inspecting the land where trees were to be planted. One farm may be fitted to grow one variety of trees and another in the same neighbourhood another kind.

By Mr. Hughes (Victoria) :

Q. Might I ask why it is that around Indian Head, I do not think you will find one farm within ten miles around there that has trees around it. What record have we of the number of trees set out around Indian Head ? The officers at the Indian Head station evidently have not been impressing themselves on the farmers around them or there would be more farmers adopting their advice and setting out these trees ?

A. I cannot say about that, but undoubtedly in a great many districts the trees have been set out. I fancy that the farmers around Indian Head heretofore have probably been so busy raising grain that they have not taken time to plant the trees. There are now, though, a large number of plantations in that neighbourhood. The experimental farms have not given exclusive attention to forestry ; they have done a good deal, as Mr. Saunders will tell you, but their main object was not to grow forest trees

By Mr. Cochrane :

Q. I understood you to say that you sent an official to a farm to lay it out and then you sent him to see if the trees were planted properly, and whether they were doing well. If you do not furnish the trees what object would there be in sending a man with brains enough to lay it out and afterwards to see whether the man had been intelligent enough to set out trees properly ?

A. We do furnish the trees, that is what I am going on to say. We have the account here, and they cost about $1.07 per thousand, something in that neighbourhood.

By Mr. Stewart :

Q. Does that include packing ?

A. This includes cost of raising and nursery work; packing is a very small item. We made an arrangement with the express companies by which these trees were taken out at half cost, and I think that that price is cheaper than they could expect to get them for in any other way.

KINDS OF TREES PLANTED.

By Mr. Ross (Victoria) :

Q. What varieties of trees do you send out ?

A. I was just coming to that. They are the Manitoba maples, birch, some elm, and a good many willows, the Russian poplar, and we have the cottonwood also.

Q. Will cottonwood grow there ?
A. Yes ; we found them grow very well, except on dry sandy soils.
Q. Do they grow as luxuriously as in British Columbia ?
A. I do not think any trees grow as luxuriously there as in British Columbia.

By Mr. Blain :

Q. Is the number of applications for trees from the farmers increasing rapidly ?
A. The first year we did not expect to do anything scarcely ; we were just getting started, but there were a few that had their ground in a fit state for planting and they received the trees.

By Mr. Wilson :

Q. What year was that ?
A. That was in 1901.
As I was saying, we did not expect to do anything ; we had not men to inspect, and only a very few were furnished. That year we had 15 applications and of these 11 got trees to the number of 35,000. That was in the North-west Territories. And in Manitoba that year 36 got trees to the number of 23,800. Now, in 1902, we had 166 applications in the North-west Territories, and 91 of these were furnished with trees ; the others did not get trees, because they had not their ground fit for planting. The number of trees furnished to those whose ground was in fit condition was 105,968, that is a large increase, and there were in addition 528 pounds of seed sent out that was in the Territories for 1902.

By Mr. Ross (Victoria) :

Q. Our officers in Nova Scotia destroy all the willow trees ; we want to get rid of them, and the willows up there must be very different to what they are in our part of the country or it would be a disastrous thing to plant them.
A. What we require on the prairies is to get trees that will grow in the first place. We are not getting the most valuable trees, but we want any that will grow to make a wind-break and once we get them started and well established, then we can grow other trees in their shelter.

By Mr. Ross (Ontario) :

Q. What are the natural trees for that part of the country ?
A. The Manitoba maple, and the poplar.

By Mr. Wilson :

Q. Will you tell us how many inspectors you have to view these places where they are going to plant trees, and what do they cost the country ?
A. I will come to that a little later on if you will allow me. If I forget it please call my attention to it, but in the meantime allow me to go on with the record of the distribution of the trees.

DISTRIBUTION OF TREES FOR PLANTING.

I spoke of 166 applications from the North-west Territories in 1902, and the distribution to 91 applicants of 105,968 trees and 528 pounds of seed ; that was an increase of 151 in the applications over the previous year. Then for the next year (1903), I am still speaking of the territories outside of Manitoba, there were 355 applications received, that is last year, and of this number 179 will receive trees this spring to the number of 284,025, and 700 pounds of seed have also been distributed. That makes an increase of 189 over the previous year. Now we will take the province of Manitoba. The first year, as I have said, there were only 36 received trees to plant

to the extent of 23,800. For 1902, there were 303 parties made application, and 178 of these were supplied with 360,000 trees, being an increase of 264. For this year (1903) in Manitoba there were 678 applications, and of this number 449 will receive trees this spring, and that to the extent of 633,900, an increase of 375 in the number of applications. The total number of applications so far in both the Territories and Manitoba, is 1,517, and the number that will have received trees after next month is 944. The total number of trees distributed will then be 1,442,693, 1,228 pounds of seed have also been distributed.

By Mr. Hughes (Victoria) :

Q. Free of charge ?

A. Yes. The best way I thought was to furnish them with plant material ; they have been getting their trees free heretofore from the experimental farms anyway.

Q. Have you ever taken notice that as you travel through the North-west you will see that possibly some Englishman may settle down in some locality and may not possibly make as good a farmer as other men around him, but have you not noticed almost invariably that he has some little garden with trees around it. Have you ever considered the advisability of getting up a plan of a garden with the wind-break around it and having the plan together with a little description and notes of how to prepare the ground, because most people can get the trees from the nurseries, sent to the farmers all through that country to be a kind of reminder to them. Do you not think you could accomplish a good deal in that way. Some people forget if their attention is not called to it by a nice little pamphlet such as I mention. Would not that be of some service ?

A. In regard to the first question I had noticed it, and can easily account for it. In the eastern provinces, in this district here, people generally pay no attention to trees. They do not think they are of any use for them, and they very often like to cut them away, and when they get where there are no trees they are not accustomed to plant them and to cultivate trees from the seed, because the trees grow here naturally.

Now, with regard to this other matter of gardens. I may say that when our people go out to inspect these belts and report, with a view to have the ground properly prepared, the garden is inside the belt of trees, and while we do not profess to instruct them in the fruit growing, at the same time our inspectors are glad to give any advice as to the kind of fruit they can grow there, and other information.

By Mr. Wilson :

Q. I would like to know on what principle the trees are distributed. You said there were 1,517 applications, and only 900 of these got trees. You did not tell us how this shortage occurred.

A. The very object, the main object of visiting these places, is to find whether the land is in a proper state of preparation before sending the trees. These men send in the applications here, and the agents very often find the land is not in a fit state of cultivation to admit of our sending the trees.

Q. Do you expect them to prepare the land before going to see it ?

A. Not necessarily before we go to see it, but if it is not prepared, then we do not go again until the next year.

Q. If they have made application for the trees it shows they have a desire to get them, and they ought to have sufficient intelligence to prepare the land under your inspector.

A. A man ought to have sufficient intelligence.

Q. You do not mean to say that you are supplying a large number of people who have not sufficient intelligence to prepare the land after you have instructed them ?

A. I mean to say that a great many people have not the knowledge of how the land should be prepared.

Q. That is quite true perhaps. But, if your inspector has visited the place, and given the instructions you would think any one would have intelligence enough to prepare the land ?

A. The applications are given in here before they go there at all.

Q. If a man applies and is willing to make preparation, I do not see why he should not have the trees if you have them.

Q. In the first place, he makes application to this office. We know nothing of how the soil is. This spring we have applications in now. A man takes the list and looks over the land and perhaps he will say, 'you cannot get trees until next year ; you will have to have the land in better shape.'

Q. What time of the year do you plant ?

A. In the spring.

Q. Always ?

A. Yes.

By Mr. Hughes (Victoria) :

Q. On that point, do you think it necessary that some fellow from Ottawa should go out and say to a man that his land is not in good shape. The land is not all fit ; they want good land.

A. That is right.

Q. Would it not be better a thousand times and much cheaper and more far-reaching to have some systematic plan prepared here and to mail one of them to every farmer in the west and territories, so that they would have one, and so that a man could say, 'here is my little plan ; I can go to the next bluff and take up my trees,' and if you tell him how deep to plant, he can put them in himself without going to you.

A. We have printed directions for preparation of soil, a copy of which is sent to every applicant.

No answer.

By Mr. Cochrane :

Q. They must have climatic conditions I never experienced in my life.

THE CHAIRMAN.—That is so.

Mr. COCHRANE.—You have your garden surrounded by trees, and I never heard of a condition under which vegetables would grow in the shade, with shade trees all around the garden. I never heard that you could produce vegetables under the shade of the trees. I hope you will excuse me, but when gentlemen talk about having shade trees around the garden, it is worse than nonsense. To speak of having a garden under the shade of trees is so absurd to any man who knows anything about gardening, that I am almost on the point of saying that it is ridiculous.

The CHAIRMAN.—I invite the honourable member to visit the West, and he will find that the climatic conditions are totally different.

By Mr. HUGHES (Victoria).—Vegetabls will grow under trees.

THE CHAIRMAN.—Yes, they will. I have been there 20 years, and know a good deal about it, and if you want a garden, you want protection from the wind, the north-west and south-east wind, and if you are not protected you will not make a success.

By Mr. COCHRANE.—You want protection to keep off the wind, but you must have the sun?

Mr. STEWART.—That is it; I never said shade trees.

By Mr. Cochrane :

Q. We have been talking about shade trees.

APPENDIX No. 2

By Mr. Hughes (Victoria) :

Q. Do you say you want protection in the North-west ?

Mr. STEWART (Lisgar)—Just wind protection. In the North-west and Manitoba, when you get a garden the size of this room with sheltering trees all around it, that is where you will have your best garden and biggest vegetables, and that is what I understood Mr. Stewart to be explaining.

THE WITNESS.—I mean as a wind-break some distance away, not as a shade. We have to get away from the farm buildings a considerable distance, otherwise the snow would blow through. While I am on this subject I might pass around and show you photographs of some of the plantations that have been set out.

By Mr. Cochrane :

Q. Have you observed, or has it been observed, how far the shade of the trees extends out from the wind-break. Suppose a wind-break along one side of 400 acres of land how far would that wind-break affect the soil on each side of it ? We find in Ontario that our shade trees, a row of maples planted around our farms, is the most expensive luxury we have. We find a good maple tree destroys the ferility of the soil for some distance into the field. I counted the hills of corn opposite a row of maple trees on the west side of my farm, and I found that one of these shade trees properly developed so affected a strip perhaps four or five feet out from the fence that 24 hills of corn were practically useless, so far as the production of corn was concerned. There were some stalks, but there were no ears. Has that ever been observed in the west, or does it affect it as in Ontario ?

A. It certainly will, both the shade and the space taken up.

Q. We find it is not the shade, it is the loss in soil.

A. Both operate together. But that will only extend for a short distance, for it has been observed—I think Mr. Mackay in one of his reports speaks of the beneficial effects of the wind-break, and he makes it a rod for every foot in height. In the west we have not only to protect the crops from the winter winds, but from the hot summer winds as well.

METHOD OF PLANTING OUT TREES.

By Mr. Ross (Ontario) :

Q. They are hard winds.

A. Yes. If there is any interest in it, I will read a short description of the trees raised in the North-west. The trees are taken up in the fall and heeled in—that is for next year's planting.

By Mr. Wilson :

Q. Are they taken up in the spring or the fall ?

Q. They are taken up in the fall, heeled in, and sent out in the spring. I may say that one of the principal reasons for planting in the spring is that there is more moisture in the land at that time.

Q. You dig them up in the fall, keep them all winter, and send them out in the spring to the parties that want them ?

A. The people are notified and the trees are sent out in the spring by express. All those for the same neighbourhood are sent notices at the same time so that when a neighbour goes into the station he can bring them all out. At Indian Head it is estimated that we have the following trees : Manitoba, maple, 300,000 ; green ash, 100,000 ; American elm, 40,000 ; making a total of 440,000, and of cotton wood we have 300,000. The total number of trees available at Indian Head and Brandon is 1,169,000, not including Russian poplar. These are all available, but not all to be sent out this year.

Q. What size are these trees when you send them out ?

A. The Manitoba maples are a year old, about a foot and a half high.

Q. You talk about the American elm ?

A. Yes.

Q. What difference is there between that and our ordinary elm ?

A. It is our common elm.

By the Chairman :

Q. I would like to ask how they prepare the Russian poplar ; it is usually sent out in cuttings ?

A. Yes, cuttings and one year rooted cuttings.

Q. When are these made ?

A. In the spring. We have not sent out any Russian poplar before this year, and they will all be rooted.

Q. The experimental farms did this formerly ?

A. Yes.

Q. Sent them out in cuttings, because I have had them so ?

A. Yes.

By Mr. Wilson :

Q. I want to ask you about the number of inspectors you have and what they cost ?

A. Well, I can scarcely give you the cost. I can give you the number of inspectors we have, but the accountant will have the cost of the work.

Q. I just want the number.

A. There were three last season,—A. P. Stevenson (Nelson, Man.), John Caldwell (Virden, Man.), Archibald Mitchell (Macleod, Alberta), employed during about five months in the year.

Q. Well, is that the way they are all employed ?

A. Of course there is a permanent staff here.

Q. Who are they ?

A. There is myself and my assistant.

Q. That is Mr. Ross ?

A. Mr. N. M. Ross.

Q. And you have a secretary, that is, in the city here ?

A. No, a typewriter, and Geo. Lang, at Indian Head, that is four.

Q. You cannot give the salaries ?

A. The inspectors get $75 a month, and if they provide their own horses, $100 per month.

APPENDIX No. 2

HOUSE OF COMMONS,
COMMITTEE ROOM 34,
WEDNESDAY, April 8, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock a.m., Mr. Douglas, Chairman, presiding.

Mr. Elihu Stewart, Superintendent of Forestry, was again in attendance at the request of the Committee, and continued his evidence as follows :—

Mr. Chairman and Gentlemen, I will not detain you very long to-day, I hope. When I was before you the other day, and when your Committee adjourned, we had considered the system in operation for guarding the forests against fire and also the system which had been adopted with reference to setting aside certain areas of land for timber purposes. There were one or two things which I think perhaps in that connection I should say a little more on, as I did not explain them as fully as I should have done. There was one question Mr. Wilson asked about the staff. I said there were altogether five employed permanently. Now there is only one of these here in Ottawa, all the time, viz., the typewriter. Mr. Ross and Mr. Lang and Dr. Unwin and myself, are outside the greater part of the time in summer; in fact, Mr. Lang is outside all the time. Mr. Lang is the manager of the nursery at Indian Head ; he looks after the nursery there in summer, and in the winter he is occupied in giving lectures to farmers' institutes, and in getting the seed into bags and having it ready for the spring.

There is another matter I forgot to mention. The branch is recognized as a Dominion institution and supported by the funds of the whole Dominion, and that therefore any efforts it could make in the direction of bringing about any aid to forestry in the older sections of the country should be done, and in this connection we have formed, largely through the efforts of the branch, the Canadian Forestry Association. This association has representatives in every province, has a vice-president, in fact, in every province and in every district of the North-west. They have annual meetings, and have distributed their annual reports—that is one—of which doubtless you have all received a copy, and the officers of the branch have devoted a good deal of attention to that work, as it was held that it was well within their duties.

As to tree planting, I said something the other day. The system in operation is well known, but I want to draw your attention to the system which was tried before and the reason why the present system has been adopted. Both this country and the United States have felt that it was desirable to do something to get settlers to plant trees on their farms, especially in the prairie country. In the United States an Act was passed in 1873, known as the Timber Culture Act, which was repealed in 1891. It did not succeed in bringing about the result that was expected of it, and so it was repealed. This Act gave 160 acres of land for planting a certain area in trees. In 1899 the division of forestry in Washington published a circular bringing into operation a system of assistance to settlers in tree planting on the prairies. In this circular the reason for the non-success of the former system is given as follows—this is a bulletin from the United States Bureau of Forestry :—

'Forest tree planting has been in progress in the west for many years. Although reasonable success has usually followed skilful planting and close attention to the selection of species and to their subsequent care, many tree claims of that region are failures. This condition has largely arisen from the difficulty of obtaining accurate information at first hand regarding the most desirable species to grow in a given

locality and from the lack of personal supervision by a competent tree planter in the setting out and subsequent care of plantations. The growing of forest trees for economic purposes cannot be successfully undertaken without some knowledge of trees, their habits, and their adaptability to the place where they are to be planted. The grower must know what to plant, how to plant it, and how to care for it afterwards.'

Now, as I say, that was the system adopted for many years in the United States, that of giving a tree claim, and it was repealed in 1891. Another system was brought into operation, which is detailed in the statement I have read from. The system now in operation in the United States is similar in some respects to ours, but we go further, we give the trees. The State of New York has nurseries now in which they are raising trees for distribution.

By Mr. Wilson :

Q. These are ornamental ?

A. No.

Q. Well, what kind of trees ?

A. Forest trees, I understand. We do not do anything in ornamental trees.

Q. But I mean in New York.

A. They are raised in the Adirondacks ; I have not the list of trees, but at all events they are there for distribution. They are in connection with the Adirondack forest reserve. Practically, all the Federal Government of the United States does is to send out experts, examine the land, and make plans. We go further, we supply the trees and supervise the planting and inspect them afterwards.

PROGRESS MADE IN WESTERN CANADA, IN REARING TREE SHELTER BELTS.

I will now take a little time to show what has been done in Canada. In the report of the Department of the Interior for 1875, is included a report upon Mr. Dennis, at that time Surveyor-General, in which he propounds a system for encouraging the growing of trees on the prairie, and this was adopted and known as the tree culture claims. By this arrangement a settler was given 160 acres of land on condition that he would plant 10 acres in trees, 2,700 to the acre. If at the end of ten years one-quarter of these were growing, he got a free grant. Now, not only was he allowed a free grant of his homestead, but if he preferred to pay for a pre-emption claim of 160 acres, which otherwise would cost him $160, by growing the ten acres of trees he could do so. I show this as a comparison of the cost then and now. At that time it cost the Department $160 practically to grow that number of trees, viz., 6,750 ; now the same quantity of trees can be grown by us for about $10 to $12. As I say, we can grow trees for about $1 a thousand, and distribute them for about 80 cents (including packing and express charges). I do not know that I have much more to say on that subject. The main feature of the work is distinctly educative in Canada, and, it is not only educative, but it is also academic. In connection with that we have the object lessons that these plantations which exist all over the country afford, and we have a map here which might be passed around for the members of the Committee to see, just to give an idea of the extent that the work has assumed at present. This is only a plan which has been gotten up to show what has taken place in one section of the country, a section where planting is being done, and that by no means a section where the most is being done in that direction.

FREE DISTRIBUTION.

Now, there are just a few points on this subject of free distribution to which I would like to refer, because it has been criticised. It has been said that the government was not warranted in giving trees for nothing to the settler. Now, I might say (if there is any argument at all in that), that nearly every country that has adopted

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a forward policy in regard to forestry, is doing similar work—that is, granting aid in certain ways, either by freedom from taxation or by bonuses, or by something of that sort, for the growing of trees. I might mention a few countries that are doing that. I have already mentioned the State of New-York ; Pennsylvania is working now in the same direction, though in a different way ; in Cape Colony, for instance, the government supplies the plants, evidently free, in some cases there is a nominal charge, but in most cases they are evidently given free from the reading of the regulations. New York, as I have said, has established a nursery from which to supply plants and material for free distribution. Baden supplies plants for different areas, and also frees such areas from taxation for twenty years and gives a premium of 12 shillings per acre. In the Rhine the Province also unites individual forests and put them under the charge of one of their own officers. But in connection with North-west Canada where trees are of such great public utility, because every one knows the advantage which it is to the public to have a belt of trees growing ; not necessarily along the sides of the road, but near enough to be a shelter in winter, there can be no doubt of the benefit accruing. And if we had not done this, if we had not given these trees free, what would have been the result ? We would have gone to all the trouble of inspecting the land, as I explained the other day, and after a man had gone to the trouble of preparing the land in accordance with those instructions, he would then probably have been left without the means of getting the trees, because I hold that they could not get them unless there was some similar means to that we have adopted, by which they could be regularly supplied with trees at the proper time, and supplied with the proper varieties. If this had not been possible, they would have been left without them just at the time they wanted them to plant. The cost is very small, and I think, can be fully justified on the grounds of public utility and the public advantage that it is to have these trees growing in that way, besides the advantage which the object lesson affords. Of course, we cannot expect to go on with this all the time, but we are furnishing object lessons all over the prairie by which the settlers themselves become in a sense foresters in a small way, they become familiar with the way of preparing their land and the proper way of planting the trees and also with the proper way of looking after them after they are planted. If you read the regulations, you will find that the government have insisted with regard to the plantations that are grown from the trees we provide, that we can enter these plantations and take from them any seed, or any trees that may not be required by the party owning it, to extend his own plantation for use and distribution elsewhere, and any cuttings which are not required by the owner we are also at liberty to take, and that in itself will more than repay us for the expenditure we have incurred. That is all I have to say, Gentlemen, but any questions that any of you may desre to ask I will be glad to answer.

By Mr. McLennan :

Q. Is there any particular system of preparing the land or planting these trees ? Supposing one of these immigrants now going out west were to just map out for himself a few acres of prairie land that he wished to stock with trees ; is there any particular system by which he would be guided in preparing that land, and if he wanted to plant these trees, would he be just left to himself, just to dig a hole for each tree and put it down somewhat after the fashion in which it had been growing in the soil before, or would he be directed to plough out a regular furrow and prepare the ground properly and plant these trees in regular tiers ?

A. There is one regulation we have, that we do not allow him to plant these trees more than 4 feet apart.

By Mr. Wilson :

Q. You furnish them with planting material and with instructions ?

A. Yes. I was going to say in answer to that question that I would be very glad to pass over this circular, Circular No. 1, revised, which gives all these instructions for the preparation of the soil.

PRACTICAL DIRECTIONS FOR TREE PLANTING.

Mr. Norman M. Ross, assistant superintendent of forestry, has prepared the following general suggestions for the preparation of the soil for tree planting on the prairies :—

'The failure which has heretofore in many cases attended attempts to plant trees in the prairie districts may, for the most part, be attributed directly to the lack of preparation of the soil previous to planting. If we compare the texture of the soil on the open prairie with that of the forest, we find a vast difference. In the former case the ground is covered by a tough, compact sod and the soil beneath this is so hard as to be almost impenetrable for the roots of plants. In the forest, however, we find on the surface several inches of loose, decaying vegetable matter and a subsoil rendered comparatively open and porous, owing to the action of the tree roots. Under such conditions as these there need be no difficulty at all in planting and successfully raising young trees, but unfortunately these are not the conditions with which we have to deal, as in most places where planting is resorted to, as in the prairies, the soil is more or less compact and not suited to the growth of deep rooted plants.

In raising trees, as well as other crops, it is always advisable to follow nature as closely as possible. If we do this we may confidently expect a very fair measure of success to attend our labours. We have seen that in nature trees require a fairly loose, porus soil, and it is therefore necessary to bring the land which it is wished to plant up in trees into as nearly a similar condition as possible. It would be absolutely foolish to plant trees on the freshly broken sod of the prairie and expect them to live under ordinary circumstances.

In most cases trees will be found to do best on land that has been under crop for some years, but as many have no land under cultivation in places where they wish to plant trees, they can, by a very thorough cultivation of the soil during one season in an ordinary year bring it into a fit state for setting out the young trees. In a very dry year one season may not prove long enough to sufficiently rot the sod, and in such cases it will be more satisfactory to defer planting until the land is in a suitable condition, as upon this practically depends the future success of the plantation.

New Land.—To prepare sod land for planting it should be broken about two inches deep as soon as the frost leaves the ground in the spring. When sod is fairly well rotted it should be backset two or three inches deeper and thoroughly worked up with the disc harrows. After the second plowing the soil should receive frequent surface cultivation, in order to preserve the soil moisture and thoroughly pulverize the soil. Later in the fall a third plowing should be given, working up the ground eight or ten inches deep. In the following spring no further ploughing will be necessary except when the trees are being planted, and then a plow should be used to open up a deep furrow, in which the young trees may be set.

New land has one great advantage over old land in that it is much freer from weeds, and the work of cultivation after planting will require less labour. This does not mean that because no weeds grow cultivation is not necessary. In the North-west the supply of moisture is extremely limited, and what little there is must be preserved in the ground as long as possible. This can only be done by keeping the surface of the soil in a loose, friable condition. As soon as the surface becomes hard and baked, evaporation is very rapid, and the effect of allowing the soil to remain in this condition will be evident in a very short time.

Root or Garden Land.—Perhaps the very best preparation of the soil for trees is, in the season preceding planting, to grow potatoes or some other hoed crop requiring deep and constant cultivation, and in the fall, after the crop is removed, again plough the land as deeply as possibly.

Summer-fallow.—Deep summer-fallow is an excellent preparation.

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STUBBLE LAND.—Planting trees on stubble land is not recommended, for two reasons : first, the grain crop takes a considerable amount of moisture out of the soil instead of conserving it; and second, when the stubble is ploughed under, it leaves the soil so open that it rapidly dries out around the roots of the young trees, soon after planting, when the season is hot and windy. This does not apply in cases where irrigating can be done.

MANURING in most cases is not at all necessary, and if practiced at all should be done at least a year previous to planting. The soil on the prairie is as a rule extremely rich. What the trees desire most is a good supply of moisture ; thorough cultivation is the only way to bring about this condition. On very heavy gumbo or clay soil, such as is found in the Regina district, manuring may be advantageous, by improving the mechanical texture of the soil in making it more porous and increasing its capacity for holding water, but even on these soils it is not advisable to apply the manure at the time of planting.

SPRING PLOUGHING.—In the case where there are no irrigation facilities spring ploughing is not recommended as a general rule, for the reason that in a dry spring any deep working of the soil tends to dry it out. Another thing to be taken into account is that spring is the busiest season of the year on a farm, and it is a great advantage if any preparation can be accomplished at some other time when work is not so pressing.

FALL PLANTING.—In ordinary seasons fall planting will not give the best results, in the North-west. In a wet fall, however, it may be fairly successful, but spring planting is the method usually followed, and will generally prove most satisfactory.

SPRING PLANTING.—Planting in the spring should commence as early as it is possible to work on the land, as then the greatest advantage may be gained from the moisture left in the soil from the melting of the snow, and the young plants are able to get a firm root hold before the approach of the dry months of summer.

The expense of cultivation and establishment of shelter-belts and plantations around the farm may be greatly lessened by following a system that is very generally adopted in Europe under similar conditions ; namely, the cultivation of hoed crops, such as roots and potatoes, between the rows of trees during the first two or three years after planting out. In Germany potatoes are most generally used in this system. The young tree seedlings are planted out in rows about three feet apart and between each row is grown a line of potatoes. The advantage of this system can be easily seen and there is no reason why it should not be successfully adopted on the prairies. It has been proven beyond doubt by the Experimental Farms, that in order to get a healthy, vigorous growth of trees on the plains it is necessary to cultivate in the plantation for the first two or three years, or until such time as the trees are able to shade the ground sufficiently to keep down the weeds and to prevent excessive evaporation of soil moisture. In order to grow a crop of roots or potatoes constant cultivation is also a necessity, and if the growing of these crops can be combined with that of trees, it means a great saving of expense. Another feature recommending this system is that deep cultivation in the preparation of the soil, is necessary, both for root crops and trees.

The site for a proposed plantation should be carefully selected with a view to the requirements of the species which it is intended to plant. As a general rule it may be taken that slopes facing towards the north are best adapted to tree growth, as they are usually moister, for the reason that they do not receive the direct rays of the sun, and are less liable to sudden changes of temperature than are southern slopes. Certain trees, as willow, ash, balm of Gilead, cottonwood, and elm, thrive best on moist soil in the neighbourhood of streams and ponds and will often prove a failure if planted on high land where the supply of moisture is somewhat scanty.

Other trees, as Manitoba maple, birch, Russian poplar, white spruce and Scotch pine, are adapted to growth on higher and drier soils, although they might perhaps

thrive better if they were in positions where they could be supplied with more moisture. Such natural conditions as these must be taken into account in planning tree-planting operations, and a man who plants willow or balm of Gilead on dry soils must not be surprised if they do not thrive, but he should be careful not to blame the country or climate as being the cause of failure.

NECESSITY FOR CULTIVATION.—The main feature in tree planting in the West is that cultivation, both before and after planting, is the keynote of success, and too much stress cannot be laid on this point. It must be especially borne in mind that the great obstacle to tree growth on the prairies is lack of moisture, and any practical means which may conduce to the preservation of the soil moisture, should be used to the utmost extent. Constant surface cultivation is the best means to this end.'

CONDITIONS UPON WHICH THE DEPARTMENT EXTENDS AID TO TREE PLANTING.

We have another circular in addition, which sets out the system adopted by the department. It is as follows :—

'The Forestry Branch of the Department of the Interior is prepared, as far as the means at its disposal will permit, to assist farmers and others in the prairie sections of Manitoba and the North-west Territories, in the growing of forest plantations and shelter-belts.

The system adopted may be stated as follows :

1. It is proposed that any owner of land wishing to avail himself of the co-operation of the government in the planting and cultivation of a permanent forest plantation or shelter-belt shall make application to the Forestry Branch at Ottawa, stating the number of the lot on which the plantation is proposed to be made, the nature of the soil and how cultivated, the nearest railway station and distance thereto, and his post office address.

2. On receipt of this application, an agent of the department will be instructed to visit and examine the land, and if he is satisfied that trees can be successfully grown thereon he will see to the execution by the applicant of a certain form of agreement which has been authorized by the department, setting forth the conditions on which the government proposes to assist in this work. The agent will also confer with the applicant while on the ground and arrange for the location of the said forest plantation or shelter-belt, advising the applicant as to the preparation of the soil, the varieties of trees to be grown, proper system of planting and other details. When necessary he will prepare a plan or sketch for the use of the applicant, showing how trees are to be planted.

3. By the agreement the applicant contracts to set apart and cultivate a certain area of land for the permanent forest plantation or shelter-belt and agrees that the trees to be grown thereon shall not at any time in the future be cut off or removed so as to injure the plantation, except with the advice or consent of the department, but it is understood that the wood and other products of the said plantation or shelter-belt shall belong to the owner of the property. It is, however, provided that the department shall have the right to take the cuttings and the seedling trees that may be growing upon the plantation, and the tree seeds, when these are not required by the owner to extend his own plantation. It is also provided that the applicant shall properly prepare the soil, plant, and care for the trees after planting in accordance with the directions of the agent of the department. This will include his providing protection against animals by fencing or otherwise, and against fire by fire-guards or other effective means.

4. The department, as far as the means placed at its disposal for the purpose will permit, will furnish seed or other plant material for planting the said forest plantation or shelter-belt.

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5. The department agrees to render the services above specified wholly without charge.

6. The department will furnish no trees for planting on town or village lots. No trees will be given to settlers already protected by bluffs or bodies of natural timber, or in cases where a good supply of natural timber is in the immediate neighbourhood, where seeds and seedling trees of native varieties can be obtained with little difficulty.

No trees will be given for ornamental planting only. Any trees sent out by this branch must be set out, either as a wind-break, shelter-belt, or forest plantation, for raising fuel, fencing material, &c.

Fruit trees and ornamental shrubs are not distributed by this branch.

It will be observed that this system is distinctly co-operative in character. The department furnishes officers to give expert advice and to see to the carrying out of the terms of the agreement, and in addition to this assists the owner of land by supplying him with seeds, cuttings or young trees ; while, on the other hand, the owner is required permanently to set apart a small portion of his land for tree growth, and to do all actual work of preparation and cultivation of the land so set apart ; to plant the seed, trees or cuttings and to take proper care of the young growth after planting, according to the directions of the said agent of the department.

Although the department desires to meet the wishes of the settlers as far as possible, it must be understood that owing to the difficulty sometimes experienced in obtaining seeds or other plant material, the government will not guarantee to furnish any specific quantity, and as in many localities, seeds, young trees and cuttings can be obtained from natural woods in the vicinity, it is advisable for those contemplating planting, to provide themselves in this way as far as possible.

Those desiring the assistance of the government as here outlined, should apply to the Superintendent of Forestry, Ottawa, before the first day of March in the year previous to the one in which it is wished to do the planting, i.e., applications for planting in spring of 1904 must be filed at Ottawa before 1st March, 1903, and so on, so as to enable the department to provide ahead for the supply of nursery stock for spring planting, and to allow time for the agent to visit the land. Applications which are not received by that time are likely to be left over until the following year.'

As I was speaking of the work in the office, a large portion of the time of the staff has been taken up in the preparation of these circulars, which has been done with a great deal of care.

Q. You explained that at the other meeting ?

A. I think I did explain the instructions for planting.

Here is another official bulletin containing further instructions for tree planting :—

INSTRUCTIONS FOR PLANTING SEEDLINGS, SEED, ETC.

Select some plot which is sheltered as much as possible from the winds.

The soil should be well worked up and in loose, fine condition.

Never sow seeds in wet, low ground.

The seed should be sown in drills, from 1½ to 2 in. deep—never deeper—at the rate of about 25 or 30 grains per running. The drills should not be closer than 1 foot, so as to allow room for surface cultivation two or three times during the season. Never allow the surface soil to become baked after a rain.

The seedlings should not be cultivated after the last of August, as late cultivation induces the young plant to continue growing too long in the fall, and does not give the new shoots sufficient time to mature before the fall frosts.

After the seeds are sown the soil should be packed pretty tightly over the drill.

Ash seed may be sown as soon as the frost is sufficiently out of the soil in the spring to allow of doing so.

Maple seed should not be sown before the 15th or 20th of May, as the seedlings when young are very tender and suffer badly from late spring frosts.

These should be planted as soon as possible after delivery, as they commence sprouting if heeled in, and these sprouts are very delicate and are sure to be knocked off during planting operations.

Cuttings are best planted with a dibble or sharp spike which should make a hole in the ground about 10 in. deep and ¾ in. in diameter.

The hole should be made in a slanting direction, the cutting inserted into the hole leaving only about 1 in. above ground, care being taken to have the buds pointing upwards. The soil should then be well firmed around the cutting, either with the dibble or by tramping.

Do not push the cutting into the soil without first making a hole, as in doing so the bark is liable to be separated from the wood at the end of the cutting, and it will then most likely fail to root.

The quickest and perhaps best way to plant young seedlings in large numbers, is to plough out a furrow as deeply as possible, hold the seedling by the top, with the end of the root resting on the bottom of the furrow, and then draw in the soil from each side with the feet, tramping it solidly around the roots.

If the furrow is not deep enough, carry a dibble or sharp stick to make a hole in the bottom of the furrow in which the end of the root should be placed.

Seedlings of cottonwood, ash, elm and maple are almost sure to die if not planted at least as deep as they originally stood in the nursery. It is best to set them about one inch deeper, as the soil will probably settle in the course of a few days after planting.

Do not plough out the furrow far ahead of the planters, as the soil dries out very rapidly.

After the trees are all set, the furrow should be filled in with the plough at once, or if the horses cannot be kept from tramping the young seedlings, a shovel or hoe should be used.

Do not hill the soil up around the stems of the trees.

While planting, the seedlings and cuttings should be carried in pails half filled with muddy water.

Great care should be taken to prevent the roots from drying out. The seedlings should never be left lying exposed to the sun or wind.

Seedlings with a single straight tap root may be very easily planted with a dibble the same as cuttings.

The best time to plant is on a dull, cloudy day or in the evening after the sun commences to get low.

Get the trees unpacked as soon as possible after you receive notice that they are at the station. If you cannot plant at once, untie the bundles and thoroughly moisten the roots, then make a shallow trench in some shaddy spot and cover the roots with moist earth. Trees properly heeled in will remain in good condition two weeks or more. Do not leave cuttings covered up in this way more than a day or two.

POINTS TO BE CAREFULLY OBSERVED.

1. Never allow the roots to become dry.
2. Plant seedlings one or two inches deeper than they originally stood in the nursery.
3. Pack the soil firmly around the roots. If a tree is properly planted it should be difficult to pull it out with the hand.
4. Set the trees out according to the plan which you have received, or instructions given you by the inspector.

Trees to be set 4 x 4 feet if no other instructions.

I would like to say that this system which we have adopted, is one of our own. If we had gone on and adopted any other system from any other country, in toto, it would have been a failure. Any system for a country like the North-west has to be worked

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out recognizing the conditions which prevail there, and to follow slavishly any other system would, I think, result in failure. The United States, as I have said before, have adopted a system to a certain extent similar to ours. It was rather flattering for me to hear from the Director of Forestry there, a year or two ago, that he was watching very carefully the result of the operation of our system, and if it is successful, no doubt they would adopt it. I have it further from Dr. Shenck, Forester at the Biltmore estate in North Carolina, and principal of the Biltmore Forestry School, that the system is one that in his opinion cannot help but work out well. I have endeavoured to show what is being done, but the system is only in its infancy as yet.

By Mr. Wright :

Q. The government has no other claim on these forest belts except what you have mentioned ?

A. Oh, no, except that they have to be permanent, and they are not at liberty to go in and cut them down in such a way as to destroy the plantation without the permission of the department.

Q. The trees have to attain a certain age before they are allowed to be cut down.

A. Yes. They are supposed to be under the care of the department, and it would be unwise I think to allow men after the department has gone to all this trouble, to enter these forests and cut them down even if they were to plant elsewhere, without some regulation and supervision by the department.

By Mr. Ross (Victoria) :

Q. What kind of trees are they growing in these belts ?

A. We have so far confined ourselves to the fast growing varieties : The Manitoba Maple, the Green Ash, the Cottonwood, the Willow, and the Russian Poplar which we are just beginning to introduce.

Q. We destroy all the willows we can in Nova Scotia ?

A. Yes, the Russian Willow is the best out there, the one that is used most, but it is anything in the beginning to start a shelter-belt on the prairie. Moreover, we encourage the young settler to arrange his home with a little seed-bed and nursery, so that if necessary he can raise his own trees.

By Mr. Robinson (Elgin) :

Q. You confine your work principally to the people of the North-west Territories and Manitoba ?

A. Altogether to the plains region. If a man has timber on his place, we refuse to furnish him trees.

Q. You do not furnish farmers in Ontario with seeds or plants ?

A. No.

Q. They are getting pretty well denuded of trees in Ontario, in some parts at least, and will have to reforest there ?

A. They are thinking of that. I know the Director of Forestry is thinking of starting in that direction.

Having read the preceding transcripts of my evidence of March 27th, and April 8th, I find them correct.

E. STEWART,

Superintendent of Dominion Forestry.

BINDER TWINE ACT OF 1902

HOUSE OF COMMONS,
COMMITTEE ROOM, No. 34,
Wednesday, October 7, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock, A.M., Mr. Douglas, chairman, presiding.

Mr. JOSEPH L. HAYCOCK, Dominion Inspector of Binder Twine, was present by request of the committee, and examined as follows :—

Mr. CHAIRMAN,—I suppose I owe the committee an apology for not being present last Friday morning, but I was informed that owing to the sad death of one of the members of the House, whose funeral was leaving the buildings at the same time the committee was called, the committee would not meet, and therefore I did not attend. Probably, Mr. Chairman, it would be well in order that we may understand this question thoroughly, to briefly state the object of the Act respecting the inspection of binder twine. You are all aware——

By Mr. Wilson :

Q. Tell us the date when the Act was passed ?
A. It was assented to on the 15th of May, 1902.

CONSUMPTION OF BINDER TWINE.

You are aware that the binder twine question is a very important one; it is of interest to three different classes in the community. It is of interest, first, to the manufacturers of binder twine; secondly, it is of interest to the farmers, and thirdly, it is of interest to the manufacturers of binders. The reasons why the manufacturers of binder twine are largely interested is obvious to everybody. It is not necessary to refer to the interest which the farmers have in it, beyond stating the fact that last year in Canada they used 14,000 tons of binder twine, 7,500 of which were imported—I am giving the quantities in round numbers,—and about 6,500 tons of which were manufactured in Canada. It cost the farmers on an average about 12½ cents per pound.

By Mr. Robinson (Elgin) :

Q. How much manufactured in Canada ?
A. About 6,500 tons.

By Mr. Schell :

Q. That was in 1902 ?
A. The year ending June 30, 1903.

By Mr. Sproule :

Q. If I understand correctly, you say there were 7,500 tons imported ?
A. Yes.

By Mr. Clancy :

Q. Well, you might give us in round figures where this was manufactured in Canada ?

A. There are ten factories in Canada. There is the Dartmouth factory, opposite Halifax, which manufactures about 1,100 tons; the Consumers Cordage Company of Montreal manufacture about the same amount; the Kingston Penitentiary manufactures in the neighbourhood of 500 tons; the two factories in Brantford, in round numbers, about 1,500 to 1,600 tons.

By Mr. Wilson :

Q. Do you know the capacity of each of these factories ?

A. No, I do not. Their capacity depends upon whether they run night and day, or whether they run ten hours a day. It depends largely upon the number of hours they run each day.

Q. You know what is meant generally by capacity ?

A. For instance, the mill at Brantford is called a 5-ton plant—that is, 5 tons a day. The Chatham mill is a 3-ton plant—that is, 3 tons per day. At Brandon they manufacture 500 tons; the Central Prison in the neighbourhood of 300 tons, and at Peterboro they claim this year they will manufacture 2,000 tons.

By Mr. Clancy :

Q. You are speaking of what has been manufactured ?

A. Well, I do not think they manufactured over 1,500 tons last year.

Q. That is where ?

A. At Peterboro. And at Walkerton in the neighbourhood of 500 tons.

Q. That is a 300-ton plant?

A. That is a 3-ton plant per day.

Q. Will they manufacture 500 tons ?

A. Manager Tolton told me they made 500 tons last year. A 3-ton plant per day amounts to 900 tons per year. Of course some of these mills do not run the whole season through. The one at Brandon last year manufactured about 500 tons.

By Mr. Ross (Ontario) :

Q. You must be giving the capacity now, for we have 6,500 tons already ?

A. Well, that is all that was manufactured, excepting a small amount—I do not know how much—that was manufactured at Chatham. The mill did not start running there until July, and I do not know just what they manufactured there this year; possibly 100 tons, not more than that.

By Mr. Stephens:

Q. No, not that amount.

By Mr. Robinson (Elgin):

Q. Have you visited all those manufacturing institutions?

A. Yes.

By Mr. Clancy:

Q. You have only mentioned eight factories, or nine including Chatham?

A. There are two in Brantford, which makes the ten. The average price for twine last year would be at least 12½ cents per pound. That on the amount used would amount to $3,500,000, which was paid out by the grain growers of Canada last year, for binder twine.

By Mr. Robinson (Elgin):

Q. Three millions and how much?

A. Three million five hundred thousand, that is at 12½ cents per pound, which is if anything below the average price last year.

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By Mr. Wilson:

Q. That is for what was imported as well as manufactured—for the whole thing?

A. Yes. Now of course the reason of the passing of this Act was that it was feared when the duty was taken off of twine, at least the argument was advanced that if the duty was taken off the country would be flooded with cheap American twine, the quality of which would be misrepresented to the farmers. I presume that the object in passing this bill was to protect the farmer in assuring to him that the twine he purchased would be what it was represented to be.

By Mr. Clancy:

Q. I do not think that was the argument used, if you will permit me, it was rather that they would take possession of this market?

A. At any rate the Act was passed. It provides briefly: 'Upon, or attached to, every ball of binder twine offered for sale there shall be a stamp with the name of the manufacturer, importer, or dealer, stating the number of feet of twine per pound in such ball.'

MARKS REQUIRED TO BE ATTACHED TO EACH BALL.

You will notice that two things are requisite on every ball of twine:—There must be a statement of the number of feet per pound, and there must be somebody behind that statement to guarantee it; either the manufacturer, the importer or the dealer. The Act also provides: 'Every manufacturer, importer or dealer who neglects to comply with the provisions of this section, shall on summary conviction, be liable to a penalty of not less than 25 cents per ball.' That is for not having the ball properly tagged. 'And every manufacturer, importer or dealer of binder twine which is not of the length per pound which is stamped upon the ball, shall, on summary conviction, be liable to a penalty of not less than one dollar and not more than $25 per ball, and all such twine deficient in quantity shall be confiscated to the Crown; provided that no deficiency in the number of feet contained in any ball shall be deemed a contravention of this section, unless the deficiency exceeds five per cent of the length stated upon the stamp.' The committee will understand that it is impossible to make every pound of twine the same length, and therefore a variation of five per cent is allowed.

Q. Is it possible to make the twine within that variation?

A. It is quite possible to get it within that limit.

By Mr. McEwan:

Q. But supposing the farmer finds that he has a ball of twine that is short?

A. He comes on the dealer, and the dealer comes on the manufacturer if the manufacturer puts out a ball of twine that is short. For instance there is a tag of the Consumers Cordage Company, Limited, stating that there are 500 feet to the pound; now, if that is a misrepresentation, the dealer who buys that twine on the representation of the company that it contains that length, if he suffers loss or damage, on account of their misrepresentation, he has an action for damages.

Q. But the farmer comes on the man he buys from.

A. Yes, and the dealer comes on the manufacturer.

By Mr. Ross (Ontario):

Q. Before you go any farther, you have given us a list of the ten factories and their production last year; is that the extent of their capacity?

A. Well, as I said, some of these mills did not run the whole year, and some of them were closed down for repairs, and some of them because I do not think they had sufficient capital with which to buy material. You must understand that to run a mill the year round requires a very large amount of capital. Manila fibre and Sisal cost on

the average $140 to $150 per ton, and where they are making three tons per day that involves a considerable outlay of capital for material. There are only about three months in the year, during the harvest, that they are getting returns from that; and some of these factories, I understand, have not sufficient capital to buy their supply of hemp—which will run them through the whole year.

By Mr. Wilson :

Q. You know every mill when it is put up is said to have a certain capacity ; that is general information ?

By Mr. Ross (Ontario) :

Q. What is the capacity of the Halifax mill, we will say ? 5 tons ?

A. I could not answer that question.

Q. I wanted to get at the capacity of the mills already in existence, supposing they are working all the time.

A. I have not that information at the present time, but if the committee desire it I will collect that information, and submit it to the department in my report.

By Mr. Clancy :

Q. I suppose the figures you give here are merely approximate ?

A. They are simply in round figures, what the managers told me when I asked them. Some of them may have inflated their output a little, and others may have minimized it. I do not want to be held responsible for these figures.

TOTAL CONSUMPTION,—PRODUCTION OF CANADIAN FACTORIES.

By Mr. Wilson :

Q. How do you arrive at the quantity used in Canada ?

A. I noticed a question on the order paper a short time ago, asking the amount that was imported, and the answer to that question by, I think, the Minister of Customs, was 7,500 tons. That is the way I arrived at that amount. The amount that is manufactured in Canada is only approximated; but I think we are not far from the correct amount at 6,500 tons.

Q. Can you give the actual amount paid for it ?

A. The figure of 12½ cents per pound is really less than was actually paid for it.

By Mr. Schell :

Q. Would that price be paid by the manufacturer or the farmer ?

A. The farmer. So that we would put the average at 12½ cents.

Q. Speaking of last year, do you refer to 1903 or 1902 ?

A. 1902; that is so far. The price varied very little in either one of those years.

By Mr. Wilson :

Q. We ought to understand whether you refer to the year ending 30th June last or not ?

A. We will speak now, and confine our remarks entirely to the year ending 30th June, 1903.

By Mr. Ross (Ontario) :

Q. Will you procure for the Department the actual capacity and the twine per pound of the 10 factories who are making twine in Canada.

A. I will.

Q. The capacity and the output ?

A. Yes, I can get that, too.

APPENDIX No. 2

By Mr. Blain :

Q. In making your estimate of the amount made in Canada last year, what estimate was made in Kingston ?

A. Between 300 and 400 tons.

Q. That differs very much from the statement in the House of the amount made there.

By Mr. Ross (Ontario) :

Q. You said 500 tons ?

A. Their capacity was 500. I don't know that I asked for exact information on that from the warden.

By Mr. Cochrane :

Q. Why can't you give this exact ?

A. I didn't understand that it was part of my duty to go into these factories and pry into their business affairs and report to the House.

By Mr. Wilson :

Q. If you give them they ought to be correct.

A. I have told you that these are only approximate.

By Mr. Cochrane :

Q. Have you any information regarding the amount that was sold by the different factories ?

A. No, I have not.

Q. Then you don't know what was actually consumed by the farmers of Canada.

A. I know this—everybody knows—it is within the general knowledge of everybody, that last year binder twine was very scarce and very difficult to get at the end of the season. I think the hon. member for West Kent (Mr. Stephens) will corroborate me in that statement.

Mr. STEPHENS.—I don't think there was so much twine imported.

By Mr. Hackett :

Q. What are your particular duties ?

A. To see that this Act is promptly carried out; to see that the balls are tagged in accordance with the Act and that they measure within five per cent of the amount marked on the tag.

By Mr. Sproule :

Q. How do you ascertain the measurement ?

A. The hon. gentleman asks the question, and as it so happens we are just about that place in the story, I will explain. Some people ran away with the idea that it is absolutely necessary to unwind and measure to tell how many feet per pound there are.

PRIMARY TEST TO ASCERTAIN CORRECT MEASUREMENT OF BALLS.

By Mr. Ross (Ontario) :

Q. Just hold up those two balls of twine, one in each hand ?

A. (Balls produced.) That is a ball (indicating one) of twine marked on the tag 550 feet per pound. Well, now, if you will take a rule, shove the strands closer together and lay your rule on the ball of twine you will find there, (counting) three, six, nine, eleven strands to the inch. When I go into a factory and find a ball of twine marked

550 feet and lay my rule on it and find there are eleven strands to the inch, I am satisfied it is within five per cent of the measure. When I find my rule, as I did here last Friday, shows that that twine is running nine—a little over nine strands to the inch—and pull the tag out and find it marked 600 feet to the pound, I know that it certainly is not running what it is marked. Now, that ball of twine (producing second ball), is marked 300 feet to the pound, pure manilla. The first ball is marked 550. That ball has eleven strands to the inch. The second one has a little over nine strands to the inch, and is marked 600 feet, while the first is marked 550. I do not presume to make a seizure or confiscate or fine anybody on that basis, but when I find the twine marked 600 feet and running about nine and a half strands to the inch, I think it my duty to actually measure and weigh which I did, with the result that I took possession of 770 balls of that twine in Ottawa last Friday, marked 600 feet per pound, and actually running 480 feet—about 120 feet to the pound—less than it should have done. Further than that, this twine has not got the name of the manufacturer on it, which renders it liable to a penalty of 25 cents a ball.

Q. What is on that ball ?

A. 'Average length 600 feet, pure manilla, draw from this end.'

Q. That is all ?

A. Yes.

COMPOSITION AND VARIETY OF BINDER TWINES.

By Mr. Hackett :

Q. Is it pure manilla ?

A. Yes, I think it is.

Q. What is the other ball composed of ?

A. 60 per cent sisal and 40 per cent manilla.

By Mr. Blain :

Q. You don't mean to say that this is pure manilla ?

A. I think that it is pure manilla. I want to say for the information of the committee that there are just as many grades of manilla as there are of hay, and just as many differences of quality owing to the kind of soil, the methods of cultivation, the method of preparation, of curing and packing and caring for.

Q. Is there some twine made in Canada and the United States of pure manilla?

A. Certainly there is.

Q. That information cannot possibly be correct, because there is not a manufacturer in Canada that will make any such statement.

A. I can show you. I want to inform the committee of a Canadian factory which makes nothing but pure manilla twine. It may mean a fibre worth seven cents a pound, or eight cents, or nine cents, or ten cents, and as high as fifteen cents, but you understand that to make a 650-foot twine you have got to purchase what is called good current manilla. You can make a 600 foot twine out of fair current manilla, or a 550-foot twine, out of what is called superior second. A 500-foot twine you can make out of second. You can readily understand that if a man could take seconds and put it up into 500 foot twine and mark it as 650 or 600 foot twine he is making money. He is saving about two cents a pound on his raw fibre.

By Mr. Heyd :

Q. You cannot make 650 foot twine unless you use pure manilla ?

A. You can't make 650-foot twine unless you use very good, pure manilla; that is a grade higher than fair current.

APPENDIX No. 2

By Mr. Ross (Ontario) :

Q. Is sisal better than low grade manilla?
A. Yes.

By Mr. Clancy:

Q. Where was that twine manufactured that you seized?
A. I do not know that; the name is not on it.
Q. Were you unable to learn?
A. I am trying to learn now.
Q. Was it imported twine?
A. It was shipped here from a town in Canada. I was going there to find where it came from.

By Mr. Wilson:

Q. Can't the dealer tell you?
A. I know where he got it from.

By Mr. Ross (Ontario) :

Q. Was the other ball made in Canada?
A. The one that was up to the standard was made in Dartmouth, for the Massey-Harris people.

By Mr. Robinson (Elgin) :

Q. Is this the first prosecution?
A. No.
Q. How many have you had?
A. Fourteen.

By Mr. Ross (Ontario) :

Q. What does this 500-foot ball weigh?
A. Five pounds.
Q. A pound to the 100 feet?
A. No, 550 feet to the pound.

By Mr. Heyd:

Q. What proportion of sisal is there?
A. Sixty per cent sisal and forty per cent manilla.
Q. That would be perfect binder twine?
A. It is a good binder twine. There is no binder twine perfect.

HOW TO TEST KIND OF MATERIALS PRESENT IN TWINE.

By Mr. Stephens:

Q. Is it made in accordance with the Act ?
A. Yes. It is a very easy matter to tell whether twine is pure manilla, sisal or mixed. Here is a pure sisal twine; if you take that twine and burn it, you will find that the ash will be perfectly white from that twine—(witness burns twine). Here is a piece of twine manufactured by the Consumers Cordage Company, of Montreal, 650 feet to the pound, guaranteed pure manilla, and I believe it is pure manilla. Now, the ash from the manilla twine that I am burning, is, as you will see, very much darker than that from the sisal. This ash is a dark gray, this is from the pure manilla twine —(ash shown to the committee).

By Mr. Wilson:

Q. I thought it was pure manilla that you tested first?

A. No, the first ash was that from the sisal. Now you see there is a very decided difference between the two. If you will kindly hand me that ball of 'mixed,' I will show you the difference. Now I will burn the mixed twine, and you will see that there are two colours in the ash from the same twine. Sisal and New Zealand give the same colour.

Q. What about hemp?

A. I do not know about hemp.

By Mr. Ross (Ontario):

Q. Is that a sure test?

A. Yes, there is no doubt about that, as far as that is concerned.

Q. Do the trade know it thoroughly?

A. If they do not they ought to. Mr. Stevens knows it, I will guarantee.

By Mr. Stephens:

Q. You cannot tell the percentage of each exactly by that test.

A. No, not exactly, but you can get a good idea.

By Mr. Heyd:

Q. About the only man who does not know, that ought to know, is the farmer.

By Mr. Wilson:

Q. Are they obliged under the law to put upon the card the correct proportions of each kind of material?

A. No, they are not. As I tell you, it is very immaterial, because here is the mixed, and you can see that the ash is mixed, about sixty per cent of it is sisal.

By Mr. Cochrane:

Q. Does the quality of the twine affect the ashes?

A. I don't think so. I will tell you what will affect the colour of the ashes somewhat. Where the twine——

By Mr. Wilson:

Q. There seemed to be some white specks in this pure manilla?

A. Well, you know, there is a very decided difference between them.

Q. Would the quality of the material affect the colour of the ashes?

A. I don't think so; not the quality of the material. I might just say that it may not be generally known, but in connection with the manufacture of twine there is a good deal of adulteration practised. In one corner of the binder twine factory you will see a large tank, which is supposed to be filled with oil. Now, this oil is conveyed from the tank over the breaker——

By Mr. Cochrane:

Q. What about the question I asked?

A. I was going to explain to you that it might be affected—the colour of the ash—by the colour of the article used for adulteration purposes.

Q. If you were to take a pure manilla before it was manufactured at all, say first class, and then have another article that was not first class—the raw material—and mix them, what would be the effect? That was the question I asked.

A. There might be a shade which could be discovered under a microscope or by an artist, but I must confess that I would not be able to do it.

APPENDIX No. 2

By Mr. Blain :

Q. Did I understand Mr. Haycock to say there were several different kinds of manilla ?

A. Several different grades, the same as there is of Timothy hay.

Q. Would you be kind enough to tell the committee, supposing you were to burn these several kinds, what would be the effect upon the ashes ?

A. Very little difference. There might be a slight difference, but very little.

Q. Supposing there was oil in it ?

A. I was starting to answer that, when interrupted. In a factory it is always necessary to use a certain amount of oil. This oil is kept in a large reservoir holding 25 or 30 barrels, and is sprinkled on the fibre as it goes into the breaker. The oil is necessary for lubricating purposes, and for keeping down the dust. The dust rises in clouds, and without oil it would not be possible to live in a factory. In some cases they put into this reservoir or tank from 15 or 20 barrels of oil, and perhaps 10 barrels of ground asbestos or low grade mineral paint. This is mixed together and showered on the twine, and in some cases you will find the twine adulterated to the extent of 18 per cent. That adds weight to the twine without adding length. Consequently this Act of Parliament is necessary, for it not only insures that the farmers get length but guaranteed purity. It is impossible for the makers to load the twine and get the length per pound they could get if they did not load it. To such an extent is this adulteration carried in the manufacture of rope, that you will find sisal rope quoted in New York at half a cent per pound less than unmanufactured sisal, owing to the foreign matter it is loaded with. So that this Act guarantees the farmer not only quality but quantity, because the makers have to buy a better quality of fibre to make 650 feet than 500 feet.

By Mr. Clancy :

Q. You told us that in 560 feet there were nine strands ?

A. Eleven strands to the inch.

Q. And the other, how many ?

A. 600 feet of twine should give twelve strands to the inch.

Q. Will it not depend upon the material used ?

A. Yes, it is the finest twine that runs longest, and you have got to have good material to spin it.

Q. There is some difference with strands of the same size owing to the material?

A. I will explain to you. There is twine with probably about 14 turns to the foot, 14½, perhaps 15 turns to the foot. It is possible to give that another turn to the foot, but if you do, you make it smaller and you shorten it. Every turn to the foot you give to a strand of twine shortens it to the extent of 20 feet on the pound, but I am speaking with regard to the average twine that is used. Then a man has to have some knowledge of twine and of fibres. The sisal is the heaviest fibre here; the New Zealand is the lightest.

By Mr. Hackett :

Q. Is manilla necessary to the manufacture of binder twine ?

A. Not at all. There is any quantity of pure sisal twine manufactured. There is lots of New Zealand sisal manufactured.

By Mr. Wilson:

Q. Is it necessary if you want the best grade of binder twine?

A. To get the best grade of binder twine, you have got to buy the high grade manilla, that is the longest twine.

By Mr. Hackett:

Q. The reason I asked the question is that we were told during the session that the embargo placed on manilla hemp coming from Manilla would be ruinous to the farmers of this country, and that we would have no binder twine.

A. Of course that is a matter of economy, it is a matter of business with the manufacturer. It depends very largely on the price of the fibres. Sometimes proportionately sisal is much lower than manilla. Last year I think there was not very much difference in the price of the manilla and the sisal, and it was more economical for the manufacturers to use the manilla. Sometimes again, the manilla may be cheaper in proportion to the sisal; it depends very largely on the crops.

By Mr. Clancy:

Q. You have stated, Mr. Haycock, what seems to be an evident truth, that with each turn you give the twine there is a loss in the length.

A. Certainly.

Q. Therefore the tighter the twine is spun, the less number of feet there are in it.

A. Yes.

Q. And the tighter you turn it, the smaller it gets.

A. The smaller it gets, and more strands to the inch.

Q. That would have the effect of making the strands smaller.

A. Yes.

Q. And of making it at the same time shorter.

A. Yes.

Q. Tell us how you worked that out. How do you work it out when you measure and find eleven strands? You have told the committee that each turn you would give the finer you make it, and the shorter it gets.

A. The question is perfectly right, and is quite capable of being explained. In the first place, there is about an average number of turns per foot that is used in manufacturing twine. If you give it more than it will stand, the twine will kink and you cannot work it. It is quite possible to have a twine turned tighter, and it is an easy matter for anybody to ascertain the number of turns per foot. In sisal twine, in the ordinary twine, they can put in about thirteen or thirteen and a half turns to the foot. In pure manilla twine, you can put in fifteen or fifteen and a half, perhaps sixteen turns.

Q. Why the difference?

A. The softer fibre is more pliable and not so liable to kink. The sisal is of a harder nature, and if you put fifteen turns to the foot in sisal twine, it is liable to kink and catch in the knotter.

Q. Are those the proportions that are used between manilla and sisal?

A. No, I may say they may use sixty per cent of manilla ?

Q. I am not speaking of the relative proportion used in the manufacture, but the number of turns.

A. Those are the usual number.

Q. In manilla ?

A. Manilla is about fifteen and a half, and in a very fine quality of high grade manilla they sometimes use sixteen or seventeen.

Q. And the other how much?

A. About fifteen to fifteen and a half.

Q. Only one and a half per cent difference ?

A. That is all. Sisal will run up sometimes to thirteen and a half per cent. Manilla makes from fifteen to fifteen and a half and sixteen, and I have seen seventeen turns to the foot.

Q. What is the object of giving fifteen or sixteen turns, every turn shortening the twine, when it is made with better material, and giving the other only thirteen to thirteen and a half?

A. Well, you will understand that the finer twine you get the harder it must be spun in order to get it to hold properly together. If you take a strand as thick as your finger, and give it four turns it will stand a very large strain, but if you take one as thick as a straw, you will have to give it more turns, or when you come to pull it it will pull apart. I was going to say that in the factories they test for a number of turns per foot several times a day. They have a machine for testing, but as I could not carry a machine with me, I had to invent some method of telling you how many turns of twine there was to the foot without having an expensive machine along. It is possible by the aid of a foot rule to tell how many turns of twine there are to the foot—the witness here gave an illustration of his method of determining the number of turns per foot of twine.

By an hon. Member:

Q. Do you regard that as a test?

A. A rough test. It is an illustration. You can turn that twine until you find you can run your finger through it perfectly straight without having any kinks in it.

By Mr. Sproule :

Q. Is it any part of your work to determine the percentage of material in the twine ?

A. No. As far as dealing with that question, it is not my duty to ascertain the quality of the twine at all. It is simply my duty to see that the twine runs the number of feet per pound that it is represented to run, and to see that it is properly tagged.

Q. You have nothing to do with seeing whether 'blue ribbon' twine, for instance, is pure sisal or not ?

A. Not at all, but this question was asked me, and I gave the information.

By Mr. Clancy :

Q. How are you going to determine whether that twine is uniform throughout the ball, you only see the outside ?

A. If you look at that ball of twine, if you look carefully all around it, you will sees that it is pretty uniform.

Q. That is only the outside, that examination does not disclose what is inside ?

A. As a matter of fact, the twine is not spun in balls, and we run it out from the inside to see if it is the same as on the outside. It would be utterly impracticable to spin the inside of the ball one size and to spin another size for the outside.

Q. I am going to say that I heard expert evidence that you could by putting extra attention on it, make a difference. They can do that very easily.

A. What object would there be in doing that ?

Q. The object would be this, that if it were spun more loosely on the inside, you would have a greater length as stated here to-day, and if you spun it more tightly on the outside of the ball, you would be utterly misled in your measurements as to the quantity in the ball, by the method you have described ?

A. If my friend understood the twine business, he would know that the spinner does not know what particular part of that twine will come on the outside of the ball. It is not run from the jenny to the ball, but it is taken into another room and made into the ball by another machine altogether. It is therefore utterly impossible for any spinner to know what particular part of the twine will come on the inside or the outside of the ball.

By Mr. Ross (Ontario) :

Q. Then you weigh the balls as well as measure them ?

A. No, that is no part of my duty, the Act does not require that, but it should.

Q. You were able to tell by the weight of the balls the length of the twine ?

A. I have a table by which I can do that. There are four kinds of twine, the standard sizes are 500, 550, 600 and 650 feet to the pound ; these are about the usual sizes. I have a table which I have worked out which gives you on 500 feet twine for one ounce 31¼ feet, and for two ounces 62½ and so on. If I weigh that ball of twine, this is the 550 feet, and supposing it weighs four pounds, fourteen ounces, all I have to do is to look at the table and I find I have to add for the fourteen ounces, 48 feet, and four times 550 are 2,200, that would make 2,681 feet there should be in that ball. If I measure it, and find that length there, it is all right, and if it is not there it is not right, that is all.

By Mr. Robinson (Elgin) :

Q. Do you run the whole ball out to measure it ?

A. When I find a short one, I put my rule on the ball of twine, and if I find it is not running the length that it should I usually take it over to the hotel and test it for one pound, or two pounds if it is running very closely. Then when I find it is short I take it back to the man who owns it, and I measure it in his presence ; then I take another ball, and I let him take a ball and measure it himself.

Q. You are under no obligation to do that ?

A. No, but it is just as well to treat these people fairly.

By Mr. Clancy :

Q. Though you had found the proper number of feet in it, would that ball (the sample seized by Mr. Haycock) pass inspection ?

A. No, because it is not properly marked.

Q. But supposing it was properly marked ?

A. Yes. I have nothing to do with the quality.

Q. It is no part of your duty to take such twine as that ?

A. No.

Q. That twine would not run through any machine ?

A. You have no Act of Parliament in Canada that directs me to determine that.

By Mr. Blain :

Q. Have you made any effort to find out where that twine which you seized was manufactured ?

A. I am making an effort.

Q. If you ascertain the name of that party will you incorporate it in your report ?

A. I will if I find out.

Q. You can tell whether it was imported or whether it was made in Canada ?

A. I cannot.

Q. Not from the dealer ?

A. The dealer did not know where it was made. He simply bought it from another dealer.

By Mr. Ross (Ontario) :

Q. A wholesale dealer ?

A. Well, he was wholesaling this lot anyway.

By Mr. Robinson (Elgin) :

Q. It is very evident that that law requires to be amended so that you can reach such cases.

No answer.

By Mr. STEWART,—This twine (sample seized by Mr. Haycock) will run through a binder all right. I have run such twine through a Massey-Harris binder myself.

APPENDIX No. 2

By Mr. Stephens :

Q. If a man bought that twine for 550 feet twine, it would pass as far as you are concerned ?

A. Yes, if he bought that for 500 feet twine, it would be so marked, and if it was marked with the name of the manufacturer I would not interfere with it.

Q. It would be good value for the farmer on that basis ?

A. Yes.

Q. How many kinds of twine are made at Brandon ?

A. 500, 550, and 600 were the only kinds they had in stock when I was there. The 600 went 621 feet to the pound, the 550 ran 575, and the 500 ran 498, by actual tests.

Q. How many different kinds of twine are made in Canada, that is without going over all the factories ?

A. As I say, there are four grades of twine, the 650, the 600, the 550 and the 500. These different grades may be made of different material. For instance, this year the Kingston Penitentiary made 600 feet twine of pure manilla, then the 550 feet twine is made of 40 per cent of manilla and 60 per cent of sisal. I was at the Kingston Penitentiary the day before yesterday, and saw 550 foot twine of 60 per cent manilla and 40 per cent sisal. Some use New Zealand, and some New Zealand and sisal, and some again use New Zealand with manilla; it all depends. Supposing, for instance, a man buys a thousand bales of manilla fibre in New York. It is bought on the same priniciple as wheat is bought in the North-west. If you buy a carload of No. 1 Northern to be delivered at Port Arthur, when it gets to Port Arthur it is graded there. If it is graded as No. 2 Northern, you only have to pay the price of No. 2 Northern; but you have to take it anyway. You purchase a thousand bales of manilla fibre from the New York brokers, and the Board of Arbitrators inspect them, and they say whether they are 5 per cent below or above the grade which the fibre is represented to be, and you pay in proportion to what the arbitrators fix as the value of that hemp above or below the price of the grade you have bargained for. If you want to make 600 feet twine, and you get a grade of fibre 10 per cent better than you require, you mix a proportion of lower grade fibre, either sisal or lower grade manilla, or in some cases New Zealand, in with that high grade fibre, to bring it down to the quality and price of twine you desire to make. You have to vary the quantity of lower grade material that you use according to the quality of manilla you purchased.

By Mr Clancy :

Q. You have gone very fully into that, I see. Have you taken up the question as to the price of the twine according to the relative proportions of the material, and how it works out ?

A. No, I have simply got at this information casually in going through the factory.

Q. What was the average price of the raw material during the past year ?

A. I have not looked into that closely, but I looked at the *Cordage Journal* the day before yesterday, and I think they quoted it at 9 cents.

Q. What about Kingston, your own city ? There is a public institution you have access to there. What had been the price paid there last year ?

A. I could not tell you. I am going to ask the Department to allow me to subscribe for the *Cordage Journal*, and if they do that I will be able to give the committee that information.

Q. I suppose Kingston would be a fair standard by which to gauge prices?

A. Yes, I think so.

Q. You have no idea what they paid ?

A. I think Mr. Platt told me the other day what he paid for his last thousand bales, but I have really forgotten. I had no object in recollecting; it was merely a casual conversation.

By Mr. Wilson:

Q. Just one question before adjourning. When you received your commission, did you get instructions as to what your duties would be?

A. Yes.

Q. Are those instructions printed?

A. They were typewritten.

Q. Have you them with you?

A. No, I have not, but I can tell you what they were.

Q. Well, we will get that information this afternoon.

The committee adjourned.

The committee resumed at 2 o'clock, p.m., Mr. J. L. Haycock recalled.

THE CHAIRMAN.—We will just continue the evidence of Mr. Haycock.

DEPARTMENTAL INSTRUCTIONS TO INSPECTOR.

THE WITNESS.—I was asked this morning by the member for Lennox (Mr. Wilson), if I would produce my instructions from the department. I have been able to get a copy.

MR. WILSON.—Read it.

A. (Reads) 'Your duties in connection with this office will be to visit from time to time, as occasion may seem to require, each of the manufacturers of binder twine in Canada, and familiarize yourself with the mode of manufacture, to see that the terms of the Act are strictly complied with in so far as regards the number of feet per pound in the different varieties of twine manufactured at such factories. It is, of course, understood that no twine can be manufactured of exactly the weight specified, that is to say, that no two balls will be exactly alike, and variation of five per cent is allowed under the terms of the Act. You should occasionally visit some of the establishments of the larger importers and dealers of binder twine, and ascertain by actual inspection whether the imported twine is marked and is in compliance with the terms of the Act. With respect to complaints which may reach you from individual farmers, it is a question to what extent an investigation is desirable. It might be necessary under certain circumstances to investigate; but ordinary complaints, if coming from a distance, and unsupported with evidence that would seem to make the matter of importance, had best be left to the action of the complainant himself, as any person under the terms of the Act can prosecute if he feels himself aggrieved.'

These are my instructions. Now, then, Mr. Chairman, with regard to the carrying out of my duties. The first thing I did after my appointment, was to visit all the factories in the Dominion.

SOURCES OF MATERIALS USED IN BINDER TWINE.

By Mr. Ross (Ontario) :

Q. Before you go any further, I want to know the original source of production of the materials used in binder twines.

A. Well, of course, the Philippine Islands; all the manilla fibre comes from the Philippine Islands. Sisal is grown in tropical countries and semi-tropical countries as well. Sisal you have all seen growing, if you would recognize it—the ordinary cactus plant, known as the Century plant, is sisal; that is, sisal is a variety of cactus that grows

very much similar to the Century plant. If you take the leaf of a Century plant, you will find the fibres are laid close together, that fibre which forms the support of the plant. It is put through a machine and the pulp knocked out. Sisal is grown in the Bahama Islands, Cuba and most largely in Yucatan. However, some of it has been grown in Mexico, while the Deering people, I understand, have purchased 50,000 acres of land in Mexico for the purpose of setting out plantations of sisal. Then there is New Zealand fibre, which enters into the manufacture when other fibres are expensive. That is grown in New Zealand.

By an hon. Member:

Q. Do they call that plant the sisal?

A. The sisal or hennequin. The botanical name for sisal is Agave Sisalana. The New Zealand fibre is Phormiun Penax.

By Mr. Ross (Ontario) :

Q. Is it a sisal?

A. No, it grows very similar to the rushes which grow along our streams from six to eight or ten feet high.

By Mr. Robinson (Elgin) :

Q. Coarser?

A. Yes, but strong.

By Mr. Ross (Ontario) :

Q. Anything else than these enter into the manufacture of twine ?

A. Well, they are making some now out of flax. Then there is a fibre called Istle. Then there is a fibre called Palma fibre, and there is also the Chinese jute. All these are too short to make binder twine. You have to have a pretty long fibre to make binder twine.

By Mr. Stephens :

Q. Was any flax twine made in the North-west this year ?

A. None made; but I can show you samples of flax twine made in Chicago and sold throughout the North-west this year. There is some flax twine—(sample produced).

By Mr. Heyd :

Q. Tell us the objection to the flax twine.

A. Well, the flax twines have given good satisfaction, but one objection is this, that the flax fibre makes beautiful mouse nests or gopher nests, and unless prepared in some way to prevent them eating it, they cut the twine and loosen the grain.

Q. Do the grasshoppers eat it as well ?

A. Yes. They claim now to be able to prepare it to make it insect proof; but another question arises, if the cattle eat it will it injure them ?

By Mr. Thomson (Grey) :

Q. Do you consider flax is cheap ?

A. They were selling it at a lower price.

Q. It is much heavier ?

A. The cost per foot is cheaper.

Q. What difference ?

A. There would not be very much difference.

Q. How much ?

A. For 500 foot twine they got 11 cents, while 500 foot sisal would cost 11½ or 12 cents.

Q. This flax twine, 500 feet to the pound—is that of sufficient strength to hold grain ?

A. Yes.

By Mr. Sproule :

Q. Is that made of ordinary flax fibre ?

A. Yes.

Q. Is there any of that used in Manitoba ?

A. Yes.

By Mr. Stephens :

Q. That is made coarser ?

A. I came across that in Manitoba.

By Mr. Thomson (Grey) :

Q. Did you say it would run 500 feet to the pound ?

A. I do not know. I never actually tested it. I collected penalties because it was not marked.

Q. I would not consider that that is over 400 feet to the pound. That would make it much dearer than other twine.

A. That is a question of the future. It is not in connection with my duties.

By Mr. Wilson :

Q. It must be marked, I suppose ?

A. If it is not marked, I fine them. If it is not marked I cannot say that it is misrepresented, because there is no representation made. I fine them because the tag is not there.

By Mr. Heyd :

Q. They grow thousands of tons of flax out west, and burn it up.

A. Millions of tons, or at any rate thousands. There is enough flax fibre burned in Manitoba every year to provide the country with binder twine.

Q. What we want is to devise a plan to make flax binder twine ?

A. Yes.

By Mr. Thomson (Grey) :

Q. Are you in a position to instruct us in this respect ?

A. That is outside my duties.

Q. What are your duties ?

A. I have just read them, but I will explain again, that my duties briefly are to carry out the Act that has been passed by this Parliament with respect to the sale of binder twine. It provides that upon or attached to every ball of binder twine for sale there shall be stamped the name of the manufacturer, the importer or the dealer, and the number of feet per pound per ball. The Act provides a penalty of 25 cents per ball when that stamp is not attached, and $1 per ball for every ball that does not measure within 5 per cent of what it is represented to measure. My duties are to enforce that Act, and to see that it is not violated.

Q. Now, since you have assumed your duties, is it your intention to politically stump the country ?

A. I do not think that is a subject which comes within my sphere here.

Q. I think it is a very pertinent question.

THE CHAIRMAN.—This is not a political committee at all.

THE WITNESS.—I think if you will place a prefix to that word 'pertinent' you will come near a description of it.

APPENDIX No. 2

By Mr. Heyd :

Q. You think it impertinent to ask such a question under the circumstances ?

A. I think so. I may say in reply to this gentleman that I have every desire to use the utmost courtesy in replying to any questions put to me. Whether the questions are courteous questions or not I shall reply courteously. Since my appointment I have not appeared on any public platform, nor is it my intention to do so as long as I retain the position. I will add a rider to this : Unless some member of this House attacks me, either attacks the position and tries to show that it is not necessary, or attacks me personally to try to show I am not fit for the position, then I claim the right and the privilege of defending myself.

By Mr. Wilson :

Q. I do not think so.

A. Then I will take it anyway.

THE CHAIRMAN.—The question is not pertinent to the business in hand. This is purely a non-political committee, and we have never allowed in the past any reference to party politics in our midst. I remember the first report I had the honour of submitting in 1896 to this committee, that there was a slight reference in the preamble—a single phrase,—and I struck it out at once when I was informed that the committee was a non-political one, and I would like very much as chairman, that we should endeavour to adhere to that rule as far as we can.

By Mr. Robinson (Elgin) :

Q. As I understand Mr. Haycock, he stated that he had fined fourteen different parties for infringing upon our rights. I would like to ask to whom the fines were paid ?

A. I was just proceeding after reading my instructions to tell you how I had carried them out, and what the results had been. This will be an answer to your question. Immediately after receiving my appointment, I proceeded to carry out my instructions by visiting the factories. I visited the factories at Dartmouth, Montreal, Kingston, Peterboro, Toronto, two in Brantford, one at Chatham and one at Walkerton. I then visited some of the larger importers in the cities of Kingston, Toronto, Hamilton and other places.

By Mr. Wright :

Q. Which one of the Brantford companies is in the Farmers' Company ? are they both ?

A. They go under that name. To continue, I may say that after having visited these factories, and the largest places in the province of Ontario, and learning that the harvest in Manitoba was about to begin, about the middle of August I started for Manitoba, and spent five weeeks in the country. I visited a large number of places, and I may just say that the first place, the first point at which I got any bad twine was at Gretna. There I found a lot of twine that was not marked in accordance with the Act, and I inflicted a penalty of $25, which was paid and deposited to the credit of the Receiver General of Canada.

By Mr. Blain :

Q. What was wrong with that twine ?

A. The trouble with that twine was that the name of the manufacturer was on it, but not the number of feet per pound. After they had paid the penalty I thought there was no objection to marking the number of feet per pound in pencil before again offering it for sale, as I had no power to confiscate the twine.

By Mr. Gilmour :

Q. And do you say you inflicted a penalty ?

A. I did.

By Mr. Sproule :

Q. You inflicted a penalty without bringing the party before a magistrate ?

A. I did so. If the party was satisfied, and would sooner pay the penalty than go before a magistrate. However, it is a matter for you people to discuss.

By Mr. Thomson (Grey) :

Q. Whose make of twine was it ?

A. I would ask the chairman if I could go into that matter.

By Mr. Wilson :

Q. Will that not appear in your report ?

A. It was reported in my report to the Department.

Q. In every case when you found the violation of the Act for the first time did you impose a fine ?

A. Certainly; there is nothing in the Act that will let me out of that.

By Mr. Blain :

Q. Do I understand that after the fine, you had the twine again marked and that the agent went and sold it ?

A. Yes.

Q. Do you consider you would have the right and power to do that ?

A. I find the Act says that every ball of binder twine that is offered for sale shall have attached to it a stamp with the name of the manufacturer, the importer or dealer, and the number of feet per pound. This twine had the name of the manufacturer, but not the number of feet per pound and I had to fine this man. I told him that all he had to do was to put the number of feet per pound on that ball, and that it would comply with the Act.

Q. Surely that man would not have that power, would he ?

A. I don't know why.

Q. I can easily understand why ?

A. Not if he marks it properly. If he marks it improperly, then he is liable to a penalty of a dollar per ball.

Q. Suppose that any dealer in this city had ten tons of twine ?

A. Yes.

Q. And you went and inspected it and found it did not come up to the requirements of the Act ?

A. Yes.

Q. Would you think that the dealer had any right, under your instructions, to mark the twine with the number of feet and then go and sell it ?

A. He could mark it anything he liked.

Q. Not after paying the penalty ?

A. Yes.

Q. Surely, the agent would not have that power ? I would have thought that that twine ought to be put off the market entirely.

A. Then bring in amendments to the Act to that effect. I can only work with the tools I have got. Now here is another instance, where the tag has not the number of feet per pound. It complies with the Act so far as the name of the manufacturer, or importer or dealer is concerned, but has not got the number of feet per pound. All I could do was to collect a penalty of 25 cents per ball according to the Act, which I did. I said to this man, 'if you had the number of feet per pound, neither I nor

any one else could touch it, and if you put the number of feet on the twine that it actually measured you would be perfectly safe.'

Q. Supposing an agent in this city was to buy ten tons of twine and it had on a tag such as you have in your hand, and bore the name of the importer. If that is put on then, the agent having the twine could decide for himself the number of feet per pound?

A. Yes, and if he does not do it correctly then he is liable to a fine of $1 per ball or confiscation.

Q. Then the Act has no value, because it says it must bear the statement of the manufacturer ?

A. It says, 'the manufacturer, importer or dealer.'

Q. Il you allow that to go, then each man would have the right to put on the number of feet per pound, himself?

A. My friend evidently has not read the Act.

Q. My friend need not tell me about reading of the Act ; I read it before he did himself.

A. I don't think so. What does the Act say ?

Q. No man will pretend to say that the Act makes the statement that any dealer that has twine in his establishment could put the tag upon it and put the required stamp upon it himself ?

The Act says, 'every manufacturer, importer or dealer.'

Q. When an inspector finds the twine not up to the requirements of the Act, what is he to do with it ? Is he to tell the dealer to mark it, or is he to confiscate the twine to the Crown ?

Mr. HEYD.—He can only do that when it is short.

Q. When it is short—perhaps I misunderstood the gentleman ? I want to ask whether I have understood the inspector correctly, when he says he found this twine without the proper tag upon it according to the Act. When the number of feet per pound is as provided by the Act, would you regard that as living up to the law ?

A. I would regard it as a violation of that particular part of the Act.

Q. Then what is your duty ?

A. To inflict a penalty of 25 cents per ball where the twine is not properly tagged, and of from $1 to $25 per ball where it is marked and not within 5 per cent of the mark.

Q. And confiscate it to the Crown?

A. Yes.

Q. You pick out one ball and confiscate it to the Crown, and let the other 1,000 balls go ?

A. No. Mr. Chairman, I think this matter is rather one for discussion in regard to amendments to the Act. If we take up the whole time threshing this matter out, we will hardly get through to-day.

Mr. SPROULE.—It is quite proper to ascertain what Mr. Haycock's duties are, and whether he is strictly carrying out those duties.

By Mr. Blain :

Q. 'Every manufacturer, importer or dealer who neglects to comply with the provisions of this section shall, on summary conviction, be liable to a penalty of not less than 25 cents per ball; and every manufacturer, importer or dealer of binder twine which is not of the length per pound which is stamped upon the ball, shall, on summary conviction, be liable to a penalty of not less than $1 and not more than $25 per ball, and all such twine deficient in quantity shall be confiscated to the Crown.'

Mr. HEYD.—Deficient in quantity ?

By Mr. Blain :

Q. Do I understand the inspector correctly, when he stated that on finding this twine it did not have the number of feet per pound in the ball which was stamped upon the tag ?

A. It did not have any number of feet at all stamped upon the tag.

Q. Do I understand you to say that this twine shall be confiscated to the Crown or not ?

A. No, it did not make any misrepresentation; the tag does not make any representation at all as to the number of feet.

By Mr. Gilmour :

Q. I understand you to say that you imposed fines for contravention of the Act, and I wanted to ask you if that was done in your capacity as inspector, or whether it was in your capacity of magistrate ?

A. The answer to that question is simply this: When I go into a place and I find——

Q. Could you not give that answer in one word ?

A. Well, I want to say that my method is this,—in order to explain the matter more fully,—I go into a store and find twine improperly marked, or deficient in quantity, and I convince the storekeeper or dealer that his twine is contrary to the Act. I say to him: 'You are liable to such and such a penalty; you can either pay that to me, of I will be compelled to bring you before a magistrate;' and if he pays me that penalty, why should I go and drag him before a magistrate, when he pleads guilty and is willing to pay up the penalty; he is probably an innocent party. Why should I add costs to the penalty under such circumstances. I had instructions from the department that I have the power to collect the penalty.

Q. You consider that under the statute you are authorized to impose the penalty and collect it ?

A. I do not impose the fine; I simply collect the penalty. I do not convict the man, I simply collect the penalty.

Q. You persuade him that the fine will be imposed upon him, and that he had better pay you. Is that the case ?

A. They simply prefer it that way—yes, that is the way.

Q. You have been hedging so long about it. I want to attack the Act, not you.

By Mr. Johnston (Lambton) :

Q. You act exactly as the Customs officers?

A. Yes.

By Mr. Gilmour :

Q. Yes, but the Customs officer has to submit to revision of his acts.

By Mr. Wilson :

Q. I do not approve of the way of doing that. If the man is innocent he should not be fined at all, and I think there should be some discretionary power given to the inspector in that regard; but if they are guilty they should be exposed as a terror to evil-doers. This is a new office, and things have been, in a sense, running a little loose. I can understand how a dealer might easily be caught unawares, and therefore I do not think he should be punished, but if he is guilty he should be given the full penalty of the law.

A. I may say there has never been a dealer that has been fined, but that the penalty came out of the manufacturer who sold him the goods.

By Mr. Ross (Ontario) :

Q. Just here I think the Act should be changed in this respect that no twine should be allowed to leave the factory where it is manufactured, without being stamped with the number of feet to the pound ?

APPENDIX No. 2

A. If it is an American factory we have no law to force them to stamp it before it leaves the factory.

Q. But they must stamp it and tag it properly before it comes into Canada ?

A. But you cannot touch it until it reaches here.

Q. It seems to me that to allow a dealer to have in his possession a lot of twine that is unmarked—he could make it 500, 550 or 600 feet. I say that the manufacturer should be compelled to put the number of feet on the tags before it leaves his factory.

By Mr. Ingram :

Q. Do I understand that the government has no control over the United States manufacturer in so far as putting out twine according to the law of this country?

A. You cannot enforce Canadian law over there ; you cannot touch them until they get over here.

By Mr. Thomson (Grey) :

Q. Does not the law require that the manufacturer should put a tag on each ball, giving the number of feet to the pound ?

A. The manufacturer, importer or dealer.

Q. The law is more comprehensive than I suggested, because the manufacturer would only be the Canadian manufacturer, in so far as we are concerned, but the law is broader than that, because it takes in the importer and dealer also. Why should it be allowed to come in without that stamp; the argument advanced by Mr. Ross is quite right.

By Mr. Cochrane :

Q. What I would like to know is, if Mr. Haycock, as the inspector, comes into my shop where I am selling twine and finds twine that is not tagged, what is his duty in reference to that twine ?

A. Under the Act it is to impose a penalty of 25 cents a ball.

Q. Then is that the end of that if I pay him?

A. As far as the Act goes, that is the end.

Q. Don't answer my question before I ask it. If you impose a fine and I pay it, is it left there so that the man can sell it to the farmer, the innocent farmer who comes along ?

A. That twine is left there, I have no power under the Act to confiscate that twine, but if he offers it for sale again he again becomes liable for the penalty.

Q. Now then, as I understand it, our inspector, as far as I am concerned, after I pay the fine of 25 cents a ball, the twine is left with me to dispose of to any farmer that may come in and does not know anything about it. If the inspector comes along again how does he know whether the twine is the same. As I understand it, that settles the question as far as the inspector is concerned ?

A. No. I understand your idea is that that man can offer twine again, which is quite true. I have now no power under the Act to deal with that twine except to collect this penalty. What I say to this man is this: This twine lacks the number of feet per pound. If you put on these tags——

Q. I have not come to that, yet. You only fine the man because it is not properly marked. The tag is not on it. Supposing you come to my shop again and you find a lot of twine that is not properly marked, has not the number of feet to the pound, what do you do then ?

A. Then, the lowest penalty is a dollar a ball and confiscation. I confiscate that twine.

Q. The whole of it ?

A. Every short ball that I find I confiscate. In one case I confiscated 165 balls in Ottawa last Friday. I took possession of 770 balls marked 600, which actually ran from 480 to 490.

By Mr. Blain :

Q. Have you a tag that was taken off them ?

A. Yes (produces tag). This is improperly marked, too; the name of the manufacturer is not on it.

By Mr. Sproule :

Q. Do you fine that according to the Act, a dollar a ball for every ball. What did you do with that case ?

A. The Act, if you will read it carefully, says that 'the dealer shall be held to be the direct purchaser from the manufacturer.' The gentleman in whose possession I found this twine did not purchase it from the manufacturer, so according to the Act I could not treat with that man.

Q. He should be held to be liable—the law recognizes that he is.

A. The law says he shall not be held to be liable unless he purchases direct from the manufacturer. This man was not a direct purchaser, but he bought from another dealer.

Q. Was he not offering it for sale ?

A. Yes. Amend the Act.

By Mr. Wilson :

Q. Tell us what you did ?

A. I said this twine is not only improperly marked, but short measure. I have the power to confiscate the twine. I took his receipt for the twine, to be held to my order until I find out who made the twine, and then act accordingly.

By Mr. Sproule :

Q. You have not found him yet ?

A. No.

By Mr. Henderson :

Q. The Act says the word 'dealer' whenever it occurs in this section shall be held to mean the dealer who is the direct purchaser from the manufacturer ?

A. I would not have power to deal with the offence if this man bought it from an importer; I would not have power to penalize him; but I would have power to penalize the importer if I could find him. I think you can trust me to do that.

Q. Do you think the Act in this respect is lame ?

A. I do.

By Mr. Heyd :

Q. The Act evidently needs revision?

A. Since I have occupied this position I have come in contact with fourteen different lots of twine not in accordance with the Act.

FINES AND FORFEITURES UNDER THE ACT.

By Mr. Johnston (Cardwell):

Q. How many of these were Canadian make ?

A. I was just coming to explain that. Out of the fourteen lots, eleven were American, one Mexican, one English and one Canadian. I have collected in penalties $518.75, which has been paid in to the order of the Receiver General for the Dominion, and confiscated a considerable quantity of twine, which is still in our possession, and awaiting the decision of the Department what we shall do with it. I have also succeeded in driving out of this country something in the neighbourhood of

275,000 pounds of short twine. That occurs in this way. For instance, here is a tag of an American made twine, 'made expressly for Lindsay Bros., Milwaukee, Wisconsin and Minneapolis, Minnesota,' marked 505 feet per pound. I measured it and found it measured 440 feet. I immediately confiscated the ten balls that I found, and collected $10 penalties. The dealer who had this immediately communicated with the manufacturer from whom he had purchased it in Winnipeg. He immediately wired to every dealer that he had sold twine of this kind to, to ship the twine back to Winnipeg, and it was all shipped, three carloads, or 90,000 pounds, improperly marked 'short measure.' It was shipped back to the United States. He did not want to deal with this twine. He didn't want to deceive the farmer, so he sent it back.

By Mr. Wilson :

Q. Have the United States these regulations ?

A. Three states have them. Mr. Daniels, manager of the twine department of the International Harvester Company, Chicago, which represents the Deering McCormick, Champion, Plano and Milwaukee companies, with a capital of $228,000,000, and perhaps the man who knows most of twine of any man on earth, told me that they had the law in three states of the Union, but it was simply a dead letter because they had no inspectors.

Q. It is not a federal law ?

A. No.

By Mr. Robinson (Elgin) :

Q. What have you done with the twine confiscated ?

A. We have not dealt with it yet. I am waiting for the Department to say what we shall do with it.

Q. What is the value of it ?

A. In the neighbourhood of $500.

By Mr. Holmes :

Q. Is that Canadian or American confiscated ?

A. Most of it American—I say that now—I am not positive until I find out who manufactured this last lot.

By Mr. Ingram :

Q. Just one Canadian ?

A. That I am positive of.

By Mr. Johnston (Cardwell) :

Q. How many balls of Canadian ?

A. 31.

By Mr. Heyd :

Q. This was made before the Act came into force ?

A. I do not konw that, but the dealer got it since the Act came into force, consequently he is liable. There is a sample (producing twine) marked 600 feet which actually measured only 428 feet. I confiscated the 165 balls of that, and collected $165 in penalty.

By Mr. Holmes :

Q. Mr. Heyd called attention to the fact that the Canadian twine received was probably made before the Act came into force. I presume all the twine seized was made before that.

A. If that would let them off, perhaps it would be. But this Act came into force on the 15th May, 1902.

By Mr. Ross (Ontario) :

Q. Evidently the greatest transgressors are the American manufacturers ?

A. Yes.

Q. I suppose they know the law regarding selling binder twine over here ?

A. I stopped in Chicago a day or two on my way home, and went to the McCormick mills, and Mr. Daniels very strongly approved of this Act, and said that while they were largely interested in binder twine, yet it was only a side issue as compared with their binders, and that anything that was done to raise the standard of twine was in the interest of the manufacturers of binders. You will recollect that Mr. Frost introduced this Act—he is engaged in the manufacture of binders—perhaps in his own interests as well as the interest of the farmers.

By Mr. Wilson :

Q. That was introduced in the Senate then ?

A. No, in the Commons,—the General Act. We are working under an amended Act passed in 1902. The original Act was passed before that when Mr. Frost was in the House.

By Mr. Thomson (Grey) :

Q. How would this Act improve the quality of the twine ?

Q. I went over that this morning. If the hon. member wants me to go over it again I will do so. Gentlemen, there is another sample (sample produced) made from sisal grown in Mexico. I got 523 balls, collected 25 cents a ball, $130.75, and there were 65,000 pounds of that shipped out of the country under the same conditions as the other, and in all about 275,000 pounds of defective twine were shipped out of the country. This was on account of the enforcement of this Act, and the farmers would have paid for it if the Act had not been enforced. There is no doubt about that.

By Mr. Stewart :

Q. You get most of that twine in Manitoba and the North-west ?

A. Yes, Manitoba and the North-west. Right here in Ottawa last Friday, while I was waiting for the train, having nothing to do but look after my duties, I went to the By-ward market and found a small lot, only 48 balls of American twine—here is a sample of it—which was not properly marked. The number of feet per pound was on it, but not the name of the manufacturer, so I penalized the lot. The manager of the McCormack Company was here from Ogdensburg, and happened to be present when I inflicted the fine, and he paid the $12.

By Mr. Johnston (Cardwell):

Q. Do I understand you to say that you collected 25 cents per ball on all the balls that were not properly marked in Canada ?

A. Yes, all that I found.

Q. And returned the twine afterwards ?

A. Certainly; I have the right to do so. If the Act is wrong remedy it.

Q. On all the balls of twine you collected 25 cents ?

A. Yes.

By Mr. Stephens :

Q. If it had had the name of the dealer upon it, it would have been all right ?

A. It would have been all right. For instance, here is a tag that is marked with just simply the number. It should have the name of the dealer and the number of feet per pound marked on it.

APPENDIX No. 2

By Mr. Blain :

Q. If you found a tag on twine with the number of feet per pound and the quality without the maker's name, would the dealer having that twine have the right to write the maker's name on it and then go and sell it ?

A. If the twine were properly marked he would, after he had been penalized.

Q. You would have authority under the Act to instruct him to do that?

A. What I would have to do would be to collect 25 cents per ball. He would probably do as he liked. I think that there is a great deal of force in the remarks which this discussion has brought out with regard to the imperfections of the Act, and I think that the dealers should be held responsible as well as the manufacturer and the importer for this reason : Every dealer who buys twine should buy it from a reputable firm, and if that firm represents the twine to measure 600 feet when it only runs 500 feet, and he suffers loss or damage from the misrepresentation, he certainly has a good action against the party from whom he purchased the twine. I do not think there would be any harm in allowing the dealer to go back to the party from whom he purchased the twine to make good any loss he may have suffered from misrepresentation. And if that clause in the Act relating to the dealer were struck out altogether, it would be a vast improvement.

By Mr. Thomson (Grey) :

Q. Then the dealer would be responsible and not the man who made the twine?

A. The dealer would be responsible first, but he would have his recourse against the man who misrepresented the twine to him.

By Mr. Henderson :

Q. I should say that if the manufacturer or importer shipped him twine that was not properly marked either with the name or the length of the twine, he could at once call in either you or a magistrate and impose a fine ?

A. Certainly there would be nothing to hinder him.

By Mr. Thomson (Grey) :

Q. If a dealer wrote to a manufacturer and told him to stamp 650 feet when there was less than that length, would he be responsible for that ?

A. If the manufacturer could show that the dealer had given him instructions to that effect to make a bargain, why certainly the dealer would be responsible.

By Mr. Holmes :

Q. You deal with the seller ; you cannot get behind that ?

A. No, because of the imperfections of the Act.

By Mr. Robinson (Elgin) :

Q. Have any of the farmers complained to you about the twine not being up to the standard ?

A. Yes. I have often heard, I have frequently heard complaints from the farmers about having twine up to standard in the matter of length. I have had men tell me they have got balls of twine that would tie a good deal more of area than another ball of the same weight and the same mark. It is a matter of record. You can find to-day, I can produce affidavits if necessary, where the twine was measured by the farmers themselves. It was marked 600 feet and only went 400 feet. That can be substantiated by the affidavits of respectable farmers. I would like to say in conclusion, that during the winter I hope to visit the factories. The managers of those factories are very anxious to keep up the reputation of their factories, and all of them want their twines to come up to standard. I shall go to Montreal and stay for a week, and I shall make tests every day. In the Deering factory they make 400 tests a day.

In that way I think I can prevent bad twine going out through this country. As the results of this inspection and the enforcement of this Act, I believe that the farmers will receive a benefit of at least five per cent on the length and quality of their twine. That means a benefit of $175,000 to the farmers from the proper enforcement of this Act.

By Mr. Cochrane :

Q. How do you arrive at that ? How do you arrive at the conclusion that there was that much twine used in Canada?

A. I arrive at it from the return made to the House only a couple of weeks ago, that there were 7,500 tons, anyway, imported last year into Canada. In round numbers as near as we can estimate there were about 6,500 tons made in Canada, or a total of about 28,000,000 pounds, which, at an average price of 12½ cents per pound, would amount to $3,500,000. Twelve and a half cents per pound is considerably lower than the average was last year. The price last year ran about 12, 13, 14 and 15 cents for the four grades, so that 12½ cents would be a low average. Moreover, everybody knows that last year nearly all the twine in the country was cleared out in October, and it was with some difficulty that the farmers in some places in the North-west obtained twine to finish their harvest. Of course in giving that estimate I am not able to figure it down to a cent.

By the Chairman :

Q. It is as near as you can get it ?

A. It is as near as I could get it.

By Mr. Wilson :

Q. I think you will have to get out upon the stump ?

A. Probably. I would like to add to what I have already said, that I should be very much pleased to assist in framing an Act that would meet any difficulties arising in connection with the administration of the law. Perhaps it might be possible to enact a law at the present Session. Some amendments are obviously necessary, and they should be put through without delay. I might also state that on my return from Manitoba, in conversation with some of the United States manufacturers of binder twine, they said: 'Haycock, you have hit us pretty hard this year, but you will have to hunt hard next year to find any of our twine that is not up to standard. We will put on an inspector, and everything that goes to Canada will be up to standard.'

Anything that is not up to standard they will sell to the American farmer, who has not this Act nor any inspectors to protect him.

Having read the preceding transcript of my evidence, I find it correct.

J. L. HAYCOCK,

Dominion Inspector of Binder Twine.

APPENDIX No. 2

HOUSE OF COMMONS,
COMMITTEE ROOM 34,
Thursday, October 8, 1903.

The Select Standing Committee on Agriculture and Colonization met here at ten o'clock A.M. this day, Mr. Douglas, Chairman, presiding.

PROCEEDINGS.

THE CHAIRMAN.—The principal matter before us this morning, gentlemen, is the adoption of the Final Report.

Mr. LARIVIÈRE.—Before proceeding with that, Mr. Chairman, I think we might reconsider the motion adopted at the last meeting with regard to the number of copies of the evidence given by Mr. Haycock which are to be printed. That evidence deals with a very important subject, especially to the farming community, and I think it should be distributed broadcast throughout the country for the information of the farmers. They will find recorded there the way in which to test the binder twine themselves, and they will also learn how to protect themselves from being wronged by the dealers. I therefore move that the motion adopted yesterday be reconsidered, and that the number of copies to be printed be 40,000 instead of 20,000.

Mr. WRIGHT.—I have very much pleasure in seconding the resolution, because if there is one thing upon which every farmer should be educated, it is with reference to binder twine and the methods by which he may tell readily the number of feet in any ball. There is a most valuable rule laid down by Mr. Haycock in his evidence, by which the farmer can determine for himself, without asking any one else, the length of the twine in any bundle. As our friend who has just spoken has remarked, the more broadcast that information is distributed the better it will be for all concerned, for the manufacturers, the importers and the dealers, as well as for the farmer.

Mr. LEBLANC.—Will it be out of place to move that the Act itself be printed together with the evidence ?

Mr. LARIVIÈRE.—I think that is already covered, because the provisions of the Act were quoted by Mr. Haycock, and will therefore appear in the evidence.

Mr. Ross (Ontario).—I heartily concur in the proposal to increase the number of copies of Mr. Haycock's evidence which are to be printed. When you think that the expenditure for binder twine last year was $3,500,000, and that it is increasing at the rate of $500,000 or $1,000,000 annually, it will be realized that it is of the utmost importance the business should be carried on under proper control.

MR. HEYD.—Will 40,000 copies be enough ?

Mr. Ross, Ontario.—If 40,000 copies are not enough, I would say 50,000 or 60,000 even.

Motion adopted.

THE CHAIRMAN.—I dare say that our farmers from the older provinces can scarcely realize the full extent of the interest that is taken in the subject of binder twine in the far west. Where a man has 700 or 800 acres, or perhaps a thousand acres of grain, that costs him at the very least 3, or 3½, or 4 to tie it up and harvest it, you can see that binder twine is obviously a very heavy matter, amounting to hundreds of dollars. It is, therefore, very important that this evidence, which will be of general benefit not only to the manufacturers, but to the importers and dealers as well as to the farmers, should be widely distributed, and I heartily concur in the proposition.

Mr. WRIGHT.—What do you think of 40,000 copies, will that number be sufficient?

THE CHAIRMAN.—I should certainly think 40,000 copies will be all right.

MR. WRIGHT.—Do you think it is enough ?

THE CHAIRMAN.—There might be more without doing any harm.

MR. WRIGHT.—I would make it 50,000, I think.

Mr. ROBINSON (Elgin).—I fully agree with the proposition to increase the number of copies to be printed, I think that is all right. I would like that some steps be taken to place this report in the hands of the Secretaries of the Farmers' Institutes, the Grange Association, and the farmers' organizations generally, because if it goes to the Secretaries, all the members of these organizations will get the benefit of it, whereas if it goes to individual farmers only, the probabilities are that only a few will derive the benefit and the general mass will not receive the information.. The addresses of the secretaries of these organizations can be easily obtained by the secretary of this committee, whereas if it is left to members of parliament to distribute them, many will in all probabality be overlooked.

Mr. LARIVIÈRE.—There is always a certain number left over for general distribution after the members of the House have been supplied, and if any of the associations apply for copies they will obtain them.

THE CHAIRMAN.—I would throw out the suggestion to those who may be spared to be here another session, that steps be taken to have the bill as it now stands revised and made more effective. It is a question that cannot be taken up this session.

Mr. LARIVIÈRE.—I move that the remarks made by members of the committee upon this subject be reported to the House together with the evidence.—Motion adopted.

Mr. HACKETT.—Before we adjourn I desire to say one word in connection with our meetings during the present session. I desire that this committee should convey to our chairman, who is not only thoroughly instructed in theology, but is also a good farmer, the since thanks of this committee for the courteous and honourable manner in which he has presided over our deliberations during the session, and for the able and impartial manner in which he has conducted the affairs of the committee.

Motion seconded by Mr. Wright, and adopted.

THE CHAIRMAN.—I have only just one word to add. I have also very much reason to express my thanks to the gentlemen of the committee for the way in which they have conducted themselves throughout the session. I have been a member of the committee since 1896; I brought documents before the committee in 1896 and 1897, and I remember some pretty hot times, and some rough times, but upon the whole we have had a great deal of harmony and genuine good feeling. I think interest in agriculture is increasing largely and I hope it will continue to do so. I thank you for your great kindness.

The committee adjourned to make Final Report.

THE EVIDENCE

PART II

IMMIGRATION AND COLONIZATION

CANADIAN IMMIGRATION IN 1902

HOUSE OF COMMONS,
COMMITTEE ROOM 34,
TUESDAY, May 19, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock a.m., Mr. DOUGLAS, Chairman, presiding.

Mr. JAMES A. SMART, Deputy Minister of the Interior, was present, by request of the Committee, and examined upon the immigration of the year 1902, as follows:—

THE WITNESS:—I suppose the members of the Committee, many of whom were here last year, would not care to have the same course followed this year as has been in the past, as far as many of the details are concerned. It seems to me to be unnecessary to go into a great deal that has been gone into in past years.

By Mr. Wilson :

Q. We would like to have the details of the latest changes in Ireland and elsewhere ; we understand you have been completely reorganizing the system over there this year.

THE GENERAL DIVISIONS OF IMMIGRATION WORK.

A. I was going to say, I would bring to your attention simply the changes which have taken place during the past year, and tell you some of the results of our work in pursuance of the government's immigration policy. It might be well, however, to follow the same system of dividing the subject into the same divisions as were made in former years, namely, the work in Canada, our work in Great Britain, Ireland and on the Continent, and in the United States, making three divisions of the work.

In connection with our work at home in Canada, few changes have been made, in so far at all events as the staff or our system of management is concerned. Mr. Frank Pedley, who was formerly our superintendent of immigration, resigned his position, as you are aware, to become Deputy Minister of Indian Affairs. He has been succeeded by Mr. W. D. Scott, who was agent of the Manitoba government formerly, with his headquarters at Toronto. Mr. Scott was also one of the commissioners to the Paris Exhibition, and was commissioner to the Glasgow, Wolverhampton and Cork exhibitions, at all of which the Canadian government had very fine exhibits.

SYSTEMATIC CARE OF IMMIGRANTS ARRIVING IN CANADA.

You are aware that we have a system in Canada of accommodation to immigrants, that is, that we meet them at the seaports ; that we have officers of the government accompany every train, the rule being that where there are two or more carloads of people, a government representative should accompany the train, the purpose being to give information to the immigrants and to see that the cars, in the cold weather, are

properly heated, that they are kept in a cleanly state, and that they are provided with every convenience that it is possible to give to immigrants going on such a long journey as from Halifax and St. John or Quebec to Winnipeg and the west.

By Mr. LaRivière :

Q. Is there the same control with respect to the transport of immigrants by sea ; because I understand there has been some trouble lately in that regard ?

A. No. Last year, there was an arrangement by which a representative of the government should accompany parties on ships. This year, we have not been able to follow the same practice. For one thing, we do not know that it was absolutely desirable, the steamship people assuring the government that as far as accommodation was concerned, they would carefully guard the interests of the immigrants and look after them in every way and as far as they were able to do it.

It is quite true, however, as Mr. LaRivière suggests, that there was some trouble with one ship, and I think that was because of its being overcrowded, there being something like 2,000 people brought over on that voyage. However, apart from that, little complaint has come to the department with regard to the accommodation on the ocean voyage. I may say, a great deal of the success of the department has been due, in our opinion, to the way we have received the incoming immigrants, not only meeting them and welcoming them at St. John and Halifax and Quebec and accompanying them through to destination, but also in assisting them to locate on lands in the west. The great bulk of the immigrants who come to Canada now and who have been coming for the past few years, are destined for Manitoba and the Territories. I may say, there is no country in the world that compares with Canada as far as its treatment of immigrants is concerned. It is said that they do in the United States, but from the information I can gather, I find that this is an erroneous idea. The government of the United States practically does nothing, so far as the care of the people is concerned, after they pass the medical examination at quarantine, and especially the United States examination afterwards.

By Mr. Wilson:

Q. They have another inspection ?

A. In the United States, yes.

Q. Have we ?

A. Yes.

Q. How long have we had it ?

A. The medical examination we have had since the latter part of last year.

Q. Besides the quarantine inspection ?

A. Besides the inspection at quarantine. I will come to that later on. So, as far as Canada is concerned, I think we can congratulate ourselves that in receiving immigrants there is no country that has superior arrangements and has cared for and treated immigrants as this country has done and, as I say, I believe a great deal of the success of our work has been due to the favourable report, in this relation, sent home by those who have arrived here. This year, however, we found ourselves confronted with a very much increased immigration over any former year, and in order to meet the requirements we undertook to increase the capacity of our facilities for handling immigrants on arrival and for housing them in the west. We have accommodation at —I will not go through the list to show you—but our present accommodation, with what tents we have been able to secure from the Militia Department, is sufficient for about 26,000 people.

Q. Can you tell us what proportion if that is tents ?

A. Yes, a very considerable portion is tents. The buildings we have are perhaps sufficient to accommodate from 8,000 to 10,000 people. The balance are large tents or the military tents we secured from the Militia Department. This has enabled us to meet any emergency that may arise. These tents have been located wherever immi-

grants may land and in fact we had them at points where immigrants have not as yet left the train. By the kindness of the Canadian Pacific Railway we were able to secure the services of their agents at outlying points to take charge of any tents we sent there, and to provide them to immigrants who might leave the trains at those points. Then so far as the accommodation is concerned I think we can very safely say that there is very little likelihood of anything in the way of congestion at any place that the government has not the facilities to provide for. In fact, so far as the department is concerned there has been no overcrowding this year. We have never been compelled to refuse admission to any of our buildings in Winnipeg or anywhere else for accommodation over night. We have always had a little more than necessary, but in order to provide for the great influx which is expected we have lately increased the capacity, not only by securing another large building in Winnipeg (the skating rink, with accommodation for some 2,000), but also these tents, and we have also got plans for a new building.

By Mr. Boyd :

Q. You think the buildings in Winnipeg and at these other points are going to be sufficient for the immigration ?

A. Quite sufficient for all coming in this year.

Q. Are you making any further requisition on the government?

A. I was going to say that we propose, if arrangements can be made this year, to erect in Winnipeg a new building altogether. The accommodation in the present building is very limited, in fact at present we are simply using it for English and American immigrants. We have had it overhauled and painted and are using it for English and American immigrants, and we are using the large rink for the continental immigrants.

By Mr. Wilson :

Q. How much money do you propose to spend and what size of a building are you going to have ?

A. We intend to have that in addition to the present building. At present there is an arrangement on foot for an interchange of properties with the Canadian Pacific, by which we would get as good a lot, with better facilities as far as loading and unloading are concerned, and we are asking for a sufficiently large lot for the present building to be removed to, and also to erect the new building.

By Mr. Larivière :

Q. You have no idea of the new location ?

A. No, it is not settled. The Canadian Pacific has already made an offer and suggested a good site, but the government has not accepted the offer yet ; but it will be in the vicinity of the present site, and be located in such a place, as I say, to make it easy to load and unload passengers, because we intend to have a track go up beside it. At present we have to take them a block from the cars to the immigration building.

We have adopted a new plan with regard to medical examination. Heretofore, the Interior Department has never had a medical examination of immigrants arriving at seaports. I may be going too far ahead of the way the examination has been carried on in this Committee in 1902, but it may be interesting to take up this matter in more detail.

By Mr. Wilson :

Q. Has he been appointed yet ?

A. Yes.

Q. What date ?

A. It might be well, however, to explain first, before going into particulars as to appointments, and so on, that a great many complaints, or a number of complaints, were made as to immigrants arriving in Canada afflicted with certain diseases, which were allowed to pass through, naming two or three diseases—trachoma, favus, and perhaps one or two other minor diseases—which, in the opinion of the United States quarantine, should be kept out of the country. Our quarantine officers never considered these as dangerous diseases, and consequently, patients afflicted with them were allowed to pass our quarantine. From complaints made in the newspapers and elsewhere, the government was of opinion that more strict measures should be adopted so far as the Immigration Department itself is concerned, to provide for better inspection, outside altogether of the quarantine inspection. In the United States they have quarantine, as well as a further inspection, I believe, by a medical officer appointed by the government. We have adopted precisely the same system. The quarantine officers pass a ship, and if they say there is no quarantinable disease, the ship is allowed to pass. Then our doctor takes charge and examines every one. This has been working since about December—it was arranged for in November—and I will give you an idea how we do it. There is a doctor who is responsible for all the seaports, but his headquarters are at St. John, although he visits both Quebec and Halifax.

Q. Have you only one ?

A. We have an officer then at Halifax and another at Quebec, making in all three medical officers whose duty it is to examine every immigrant who lands at these ports. Now as to the principles on which we reject these I might say this, the government decided that these diseases which I have named and which are not really quarantinable should not be allowed, at least the patients afflicted with them should not be allowed to enter Canada. Trachoma is an eye disease which is at present about the only disease that there seems to be any danger with, because there are very few cases of the other diseases. Up to the present I do not think there have been any. Trachoma is an eye disease, very contagious, especially if one comes in contact with a towel used by any one afflicted with it. If you use the same towel you are apt to contract the disease.

Q. The scalp disease you pay no attention to ?

A. We have practically none.

Q. No favus ?

A. We have had very little of it. I do not think there has been a case this year, but I have a statement and I will read it to you.

By Mr. LaRivière :

Q. Do you mean this examination is confined to these two or three seaports ?

A. Yes.

Q. What about the back door of Canada, how do you manage your immigrants who come in through British Columbia ?

A. I have not heard that very many immigrants come to us through that route.

Q. There are lots of Celestials.

A. I was going to say that we have an examination at quarantine at British Columbia ports.

By the Chairman :

Q. You have another medical officer at North Portal ?

A. I do not think so.

Q. The Agriculture Department has.

MR. WILSON.—I do not think they have anything to do with this.

The CHAIRMAN.—But the country is protected at that port.

APPENDIX No. 2

By Mr. Wilson :

Q. I would ask the deputy minister what authority such an officer has to act under the Department of Agriculture ?

A. Because quarantine is under the Department of Agriculture.

Q. And it is just a quarantine officer at this point ?

A. At a quarantine station. For the information of the committee I would like to read the instructions we have given to medical officers, so you will see the position we have this in.

DEPARTMENTAL INSTRUCTIONS TO INSPECTING PHYSICIANS.

The instructions are as follows :—

'The local medical officer shall examine immigrants arriving at his port during the absence of the medical superintendent.'

The medical superintendent is practically the officer at St. John, but we have these other men for Halifax and Quebec.

'He shall examine all Canadian-bound immigrants and such American immigrants as are refused permits by the American commissioners on account of being physically or mentally defective.

'He shall order the deportation of all American-bound passengers referred to him unless, in his opinion the diseases are of a simple, non-contagious nature, or unless the person is suffering from a slight physical defect or deformity or an ordinary disease which would not prevent them from making a fair living.

'He shall order the deportation of all Canadian-bound passengers suffering from loathsome, dangerous or contagious diseases. In the case, however, of the milder class of contagious or infectious diseases he shall, if the party afflicted with such disease or his friends are in a position to pay the expenses in connection with it, permit him to enter a hospital at the seaport, and to be kept there until fully recovered before being allowed to proceed, in order that there may be no danger to the community by way of contagion or infection. These diseases will, of course, not include any that are ordinarily quarantinable, and it is therefore assumed that contagious and infectious diseases of a milder type are always detained in quarantine.

He shall, when requested, make arrangements for the medical treatment of any immigrants, at their own expense, who are in an unfit condition to proceed to their destination, and they shall be generally kept under his control until permission is granted them to leave the custody of the officers of the Department for their destination. If no accommodation can be obtained for such patients, he shall order their deportation.

'He shall order the deportation of immigrants who are unfit to proceed on their journey through sickness, whether contagious or not, and who refuse to undergo treatment in the hospital and to pay for the same, or for whose treatment the steamship company, which transported them, refuse to pay.

'If the case occurs of a parent, either father or mother, being afflicted with a disease which the medical officer considers too serious to allow it to pass, it is understood that if he orders the deportation of the person so afflicted, the family must also be deported. If, however, the parent decides to enter an hospital for treatment the agent shall, on the direction of the medical officer, arrange for the housing of the balance of the family, at the expense of the immigrant, until the recovery of the diseased one.

'All agents and officials of the department must obey all directions given by the medical officer regarding the deportation or the retention of any immigrants with respect to whose health there has been, or is, any question.

'The examination shall be made as soon after the landing of the passengers as possible, and before they are identified by the agent.

'In case the passengers are detained on the vessel after docking, he may, if necessary, conduct his examination on board. He shall notify the agent of the cases held for deportation and shall certify to their unfitness to proceed on the regular form prescribed by the department.

'He shall examine the patients detained for treatment, from time to time, and notify the agent when they are ready to proceed.

'He shall not hold the department responsible for the treatment of any of these cases.

'He shall be directly responsible to the medical superintendent, and shall enter up the results of his examination in the record book at the port and report to the Medical Superintendent in writing the details of the work after each vessel has been examined.

'The medical health officer shall keep at such seaport a classification book, which shall contain the names and classes of diseases of all immigrants arriving, together with any other particulars that may be necessary, and shall report to the superintendent of immigration at the end of each month the number of immigrants arriving and who have been afflicted with any disease, the number who have been treated and have recovered and have been permitted to proceed to their destination ; the number who have been examined by the American commissioners and rejected, and what disposition has been made of those so rejected. The report shall also show the classes of disease with which each person has been afflicted.

'The fees for examination shall be $5 for every vessel with 100 passengers or less, and ten cents extra per head for every passenger over 100.

'Examination only applies to immigrants, first cabin returned Canadians and returned cattlemen are not to be examined.

'The local medical officer shall submit his accounts to the medical superintendent for certification.'

PROTECTIVE RESULTS FROM MEDICAL EXAMINATION.

These are the regulations under which the examination is made. Now, as a result of this work during the past five months, from the 1st of December, 1902, to the end of April, 1903, I have a statement here from which I can give you the figures. At St. John, in December, there were thirty-two immigrants examined, I mean Canadian-bound immigrants. Of trachoma there were twenty-nine cases, of favus one, of pneumonia one, and of measles one. Of these there were deported twenty-seven cases of trachoma and one case of favus. There were five cases treated during the month. Of American-bound immigrants there were examined thirty-nine cases of trachoma, one case of favus, one case of pneumonia, one case of pregnancy, one case of frost bite, and eight persons accompanying patients. There were thirty cases of trachoma and one case of favus deported, as well as seven of those accompanying. The other cases were treated. In January there were seventy-one cases of trachoma examined in Canadian-bound immigrants and twenty-seven in American-bound. There were deported thirty Canadian-bound and eleven American-bound patients, and there were treated forty-one Canadian-bound and sixteen American-bound patients.

By Mr. Thomson (Grey) :

Q. Is that an American report ?

A. No, it is a Canadian report.

Q. What are you doing with Tacoma ?

A. It is trachoma, an eye disease. I had better give the totals. The total number of immigrants examined for the five months at St. John and Halifax was 284 immigrants who were bound for Canadian destinations and 181 with American destinations. The number deported was 168, of those who were bound for Canada, and sixty-nine of those with American destinations. Of those who were held, 107 Canadian-bound, and 106 American-bound, were treated.

APPENDIX No. 2

By Mr. Wilson :

Q. Between what dates ?

A. December, 1902, to the end of April, 1903.

Q. And you examined them all irrespective of destination ?

A. Yes.

Q. And if they were not sound you did not allow them to go through even if for American ports ?

A. We have the American commissioners at our ports, they have a local officer at these ports, and he examines there every immigrant for American points. If he decides that they are not to be allowed to go through, that their certificates cannot be issued to them to pass over the American boundary, of course they must be deported. In order to be sure that there is no mistake we have our officer make an examination of these, too, and so far as we are concerned we are perfectly justified, we feel then, in asking our officer to put these people back on board ship.

Q. Have you any arrangement with the Americans ?

A. They are both in this case, they are examined by both. We do not feel justified in using the authority that is given to us by the legislation of last year in a matter of this kind unless our medical officer himself also makes an examination.

Q. You might state what arrangement you have made with the American authorities.

A. We have made no arrangement in writing at all. The arrangement is simply that they understand very clearly that any immigrants that are refused by them are examined again by our officers.

By Mr. Thomson (Grey) :

Q. Out of the list you have read how many were rejected by the American officers ?

A. I cannot tell you that ; we haven't their statement, but there were 181 rejected that we approved.

Q. You cannot tell how many were rejected at first by the American officers ?

A. Perhaps that is the whole number, I cannot say definitely ; the reason I say that, is that the American travel this year is very small compared with former years and very much less than our own.

By Mr. Wilson :

Q. Above last year's very much ?

A. Much more.

Q. These people were left as far as I can understand right in our country ?

A. No, I do not think so.

By Mr. Thomson (Grey) :

Q. These are the only ones that would be re-examined.

By Mr. Wilson :

Q. The re-examination did not begin until December ?

A. Yes.

Q. Last year at the city of Montreal, here is the report of a doctor, Dr. James Barclay, he says they rejected 2,028.

A. Yes.

Q. That is in the city of Montreal—what did you do with them ?

A. No, that does not mean passengers arriving at the seaports.

Q. What does it mean ?

A. It may mean any person, any emigrant who comes to Canada and wants to go to the United States. In order to save the chance of his being held up for some rea-

son at the frontier, he goes to an officer in Montreal. They may have been people who have been in the country for years and may have contracted some disease right in our own country.

Q. There is not much trouble with Canadians getting into the United States. I think the law provides for Canadians, and I take it for granted that this is a report of the people that remained in this country, and if you read his report carefully for last year, you will find a large number came through Canadian channels who came here advised by the agents in the old country that that would be the easiest way to get in if there was anything the matter with them ?

A. I am quite aware that some have got through to Montreal and some to Winnipeg with the idea of entering the United States.

Q. Mr. Watchorn reports that.

A. Does he give the reasons for the deportation in the report ?

Q. I think he does ?

A. I do not think you will find that to be very general, largely it is on account of pauperism.

Q. He gives here trachoma, 275, favus 96, &c. This is just the diseased ones. In Montreal in addition to 4,974 deported at the seaports, there were 5,437 rejected from Mexico and Canada, and I think a very much the larger number were from Canada. That is the United States report of last year.

A. Have you the page in that report ?

Q. Page 11 of the General Report, the last report of the Commissioner of Immigration at Washington. You will see that in the last column.

A. The total from Canada was 2,013.

Q. Where do you see that ?

A. You will see the names of the places there, on page 11. 2,012 is the number.

Q. From Canada ?

A. Yes, the balance are from Mexico into Texas.

Q. And you make the total number to be ?

A. Two thousand and twelve altogether from Canada.

Q. That is giving the places they came from ?

A. Three thousand three hundred were the total, but these are not all on account of disease, you know.

Q. It does not give the reasons ?

A. A very large number of the Canadians are deported in connection with contract labour. These, with diseases, brought altogether——

Q. Five hundred and sixteen ?

A. About 500.

Q. It says 516 from both countries, at the bottom of the page.

A. Yes, but there were less than that—about 500 altogether, from 475 to 500.

Q. For contract labour there were only very few. There were 788 paupers. That is a very large number.

By Mr. Roche (Marquette) :

Q. Do you find any particular nationalities troubled with trachoma ?

A. No, it seems to be general among European nations ?

By Mr. Wilson :

Q. It is common among the Jews ?

A. There have been a few among the English, but, I think, to a very small extent.

By Mr. Boyd :

Q. Did I understand you to say that 181 were rejected by the American officers, that you accepted ?

A. Yes, our officers examined them.

Q. How do you account for the stringency of their examination over ours ?

A. It is not more stringent now ; they are practically the same.

Q. That was before your last appointment ?

A. Of course. Under our former system, under the former arrangement, the Americans simply examined their immigrants, all immigrants bound for American points, and if they were found diseased, they were deported. We had no examination of our own, and we allowed trachoma to come in ; but now we have refused admission to diseased immigrants.

By Mr. Wilson:

Q And you allowed pretty nearly everything else ?

A. I do not know what you mean by that.

Q. I mean as to the diseases You allowed almost anything to come in ?

A. We would not allow small-pox to come in, or scarlet fever, or measles.

Q. But you would not allow them to move from one point to another in your own country ?

A. I am glad to say that, in the last two or three years, we have had nothing at all in the west in the way of outbreaks of disease, compared with what we had in the past. Prior to that, we had to establish a number of quarantine stations outside of Winnipeg.

Q. I would like to call attention to a matter that appears in one of the journals—I think it is the Washington *Journal* of April 22—in which it is said that in March 3,079 immigrants who sought admission to the United States through Canada, were turned back ; that is in the month of March last.

A. They may have been nearly all in connection with contract labour, or they may have been paupers, or something of that kind, which I do not think is any reflection on Canada.

DEPORTMENT OF OBJECTIONABLE CLASSES.

Q. We do not want paupers, any more than we do diseased people.

A. We reject them for want of sufficient means of livelihood, as well as for disease.

Q. I might ask now, while we are on that matter, if your attention has been called to the action taken by Germany in giving a bonus to criminals to come to this country.

A. The same thing has occurred in connection with Sweden, and a short time ago one or two criminals were sent to Canada. We took steps to apprehend them, and refused to allow them to come off the ship We heard of one case a few years ago, and we gave instructions to keep the man. We sent a Dominion policeman to Halifax to forcibly detain that man on board the ship until it left port again, so that he did not land at all.

By Mr. Ross (Ontario):

Q. What kind of criminals were they ? Political criminals, or men of criminal tendencies ?

A. I cannot tell you. I suppose, murderers and people of criminal tendencies.

By Mr. Grant :

Q. Were they deported to Canada as a punishment ?

A I do not know.

By Mr. Wilson :

Q. You might read from page 43 of the American report, the causes for which these people were rejected.

A. Yes.

Q. You might read it aloud, so that it will go into the evidence.

A. They say that at all stations on the border their officials examined slightly in excess of 4,900 immigrants, and of these, 2,028 have been found to be inadmissible for the following causes:—Ex-convicts, 5; prostitutes, 3; contract labourers, 419; assisted immigrants, 15 ; loathsome or dangerous diseases, 496 ; cancer, 10 ; paupers, 812. Out of 800 certificates, 235 were arrested in the United States, and deported to Canada, 25, making a total of 2,028. Of these, 39 have been subsequently returned, leaving a net total of 989 rejections.

By Mr. LaRivière :

Q. Do you mean to say that all these have remained in Canada ?

A. A number of these people were in Canada for many months.

Q. And they have actually deported people, although they have lived on this side for two or three months or a year ?

A. They have required the same examination of them as they would of immigrants coming from abroad, but not for persons coming from Canada, and have ordered them to be deported, and I believe the C.P.R. has in some cases taken these people, after they have been working in Canada, and started to go over to the United States and were rejected by the Americans, the C.P.R. have taken them back to the seaport from as far back as Sault Ste. Marie, loaded them on the ship, and sent them back to the country from which they came.

By Mr. Wilson :

Q. You will notice in their report at page 11, that people, after they have been in their country for a year, were deported, to the number of 465.

A. Yes, that is a year after landing.

Q. They have been in the United States a year, and they deported them because they were either unable to earn a livelihood, or had a disase, or something of that kind ?

A. I think most of the American commissioners are very much more strict in their examination of immigrants coming through Canada, passing through Canada, or going over to the other side from Canadian points, than they really are at New York or the other ocean ports.

Q. And for very good reason. Out of all the people brought to their shores by seaport, only about two-thirds of one per cent were rejected, so careful are they with their examinations before they allow them to start or to board the ship ?

A. I may say, in connection with that, that the inauguration of our own system of examination in Europe has had a certain effect on our European immigration. While on the other side, I was informed that reports had been sent to all parts of Europe, to the various booking officers throughout Europe, in the towns and cities, advising people that it was very doubtful if they would be permitted to land under the very strict regulations enforced in Canada, as well as in the United States, if they had any of these defects ; and, as a result of that, one steamship man himself told me that a party of 200 German-Russians, who were on their way to the seaport, although there were a very few cases of this trachoma—I think, only one or two cases among them—they were so frightened of this, that the steamship people themselves simply diverted these people to Argentina, in South America, where they apparently have no medical requirements. That is only one case. I have heard of other cases on the other side where people bound for Canada, having decided to come here, and who were perhaps a very good class of settlers, but with some defect, have changed their course and have been sent to South America, instead of coming to us.

Q. On page 28 he refers here to a bill before Congress in which there is a penalty of $100 on any company bringing diseased or undesirable immigrants that might have been discovered before they came here.

A. While I think it is a very proper thing for the government to reject immigrants affected with these diseases, and to keep out all manner of disease from the

country, still it is a remarkable thing that we have never heard in Canada of any epidemic of any kind resulting from the introduction of persons affected with them. In fact, I think the effect of the climate in this country has been to prevent their development. Our climate, especially in the west, prevents any spread of that kind of disease and has a tendency to cure those who are afflicted with it ; but I think we have never heard of any spread of any disease of that kind at all.

By Mr. LaRivière :

Q. Have you not heard of any cases of a kind of leprosy, or skin disease, in Montreal, from people that came from the Continent ?

A. No, I have not.

Q. There was a good deal of talk about it in the newspapers, and it was supposed to be contagious.

A. It never came to my attention at all.

By Mr. Wilson :

Q. You would not like to wipe your face on the same towel as a man with trachoma had done ?

A. I do not know that I would, and I do not know but what I would do what we are doing to-day. I just wish to say that the spread of these diseases has never been noted in Canada, within the last few years at all events.

The CHAIRMAN.—I do not know whether we had more than one case of leprosy. We had one in my riding that was deported to Tracadie. The woman was under my charge for two years. It was Norwegian leprosy, but it has not appeared in the other members of the family, or of the neighbourhood.

By Mr. Wilson :

Q. Does the Beaver line run entirely to our ports ?

A. No, it runs from England to different ports in the United States.

Q. But it does not run to the United States ?

A. You mean the Elder-Dempster line.

Q. It is called here the Beaver.

A. It was the Beaver line. They had the Beaver line; it is now the Canadian Pacific line, so far as Canada is concerned.

Q. It is reported here that they accept everything that comes, because they can get them into Canada, that after the American vessels have sailed, the American officials having examined the emigrants that are going to either Canada or the United States *viâ* American ports, those that are rejected are of course left behind, and that, instead of their being sent back to their own home, the Beaver line takes them and sends them to Canada. That has been the case in the past ; but if you enforce these stringent regulations, that will be stopped.

A. I never heard of that.

Q. On page 17 of Watchorn's report, that is the little blue one that he published himself.

A. If there is nothing more with regard to the medical examination, I shall proceed.

By Mr. Thomson (Grey) :

Q. Does the port of Owen Sound come under your jurisdiction ?

A. No, not the inland ports.

Q. Who would appoint the examining officer there ?

A. The Ontario department, I would think.

Q. I think he is appointed either by the Department of the Interior or the Department of Agriculture.

A. He is not appointed by the Department of the Interior. Our department has not a quarantine station at Owen Sound. They have a medical officer there for the examination of parties coming in by ship from the American side.

By Mr. Ross (Ontario) :

Q. That would be in the Department of Agriculture, under the head of quarantine.

By Mr. Ross (Victoria) :

Q. That would be under Agriculture.

By Mr. Blain :

Q. I notice a reference to the fact that the Toronto headquarters have been kept busy providing accommodation for incoming people. Is there some new arrangement between the Ontario and Canadian departments in reference to immigration ? This is from yesterday's Toronto *Star.*

A. I do not know what this is. What is it in connection with ?

Q. Immigrants arriving. I will read another paragraph from the same paper : 'In common with other English immigrants arriving here, they have a vigorous kick to lodge against the accommodation provided on the ship.'

A. Is this yesterday's paper or to-day's ?

By the Chairman :

Q. There are always a few kickers in every case.

A. I might explain in a word what I presume that paragraph means. We have made an arrangement, at least we are endeavouring, on the arrival of every ship at Quebec, to divert farm labourers who may hold through tickets to the west, to Toronto, in order to relieve the situation in Ontario, and at present we find there are quite sufficient labourers for all farm purposes in Manitoba and the North-west Territories, at all events until haying and harvesting.

By Mr. Blain :

Q. That is very commendable, if you are doing that.

A. We are succeeding to some extent.

By Mr. LaRivière :

Q. So far as Ontario is concerned, when these men have through tickets, I think you might as well let them come on to us, in Manitoba.

By Mr. Kidd :

Q. You might drop off a few in eastern Ontario.

By Mr. Blain :

Q. These people are said in the *Star* to have complained bitterly about the fare on the ships.

A. There may be ships with twelve or fifteen hundred people on board, and with a crowd like that, it would be quite impossible to have everything as comfortable as might be desired. There was some complaint some time ago as to the fare, and I might say that, after the arrival of that celebrated Barr Colony, they made a great many complaints as to the accommodation on board the ship. We got statements as to what the complaints were, and have asked the steamship people to report on it, setting out exactly what the reports were that came to us, so I presume that is really a reference to the food.

APPENDIX No. 2

IMMIGRATION LITERATURE ISSUED BY THE DEPARTMENT OF INTERIOR.

Now, as to the work of the Department in connection with literature, I may say there has been a tremendous increase in the last year over the former reports that have been made to the Committee, and, with the permission of the Committee, I will either read the list or leave it to be inserted in the evidence.

By Mr. Wilson :

Q. You had better read it, and then we will all get it.

A. The following literature was issued for the twelve months :—

Pamphlet, 20,000 copies.

Q. What did that cost you ?

A. The printing ?

Q. What did it cost for the writing ?

A. It is written by one of our agents, who did it for us without charge.

The Canadian Year Book.

Copy books for the old country. We are using these altogether for the old country schools. The Committee is aware, of course, that a large part of our appeals in Great Britain in the last few years has been to the rising generation, in the schools. We have prepared a text-book on Canada, or one was prepared for us. We purchased a large number of them and distributed them amongst all the rural schools in England. We also distributed 200,000 copy books. These copy books, I may say to any members of the Committee who have not seen them, have printed at the top of each page, as a copy, something with respect to Canada which will attract the attention of the child. In connection with this special work in the old country with the schools, we have also, as you are aware, for the past two years, presented a medal, which was competed for, and we had one awarded for each school.

Q. Were there not two, one for the boys and one for the girls ?

A. I think there was only one. There were 211,500 of these books, and they cost us 4 cents apiece ; the Ontario pamphlet, we had 50,000 of these, and they cost us 9 cents, that is a large map of New Ontario ; the pamphlet we call 'Prosperity Follows Settlement,' there were 75,000 of these, and they cost 4 cents apiece ; it is a folder, a sample folder, which can be put in the pocket easily ; we printed a very large number of them for distribution in the United States particularly, and they cost us 1¼ cents apiece. The American Exhibition Folder, of which there were 40,000, costs two-fifths of a cent apiece. Advertising—these I am giving the names of, were the names of the pamphlets ; we tried to name every pamphlet published, so that it can be identified. Advertising Western Canada in the *Globe ;* Manitoba and the North-west Teritories, there were 50,000 at 4 cents each ; this is an English pamphlet published by an English writer in the west. The map of Assiniboia, we ordered 5,000 ; the New Ontario folder, 50,000 ; the Saskatchewan folder, 50,000 ; the school book, 100,000 ; the trade marks, 50,000 ; these were large cardboards about the size of this postal schedule ; we call them our trade mark, 160 acres of land free ; they are highly coloured, and are put in public places wherever we can find places to put them. A leaflet, 'Lots of Dominion Land,' 80,000 ; lithographed hangers, 51,080 ; folding maps of Canada, 100,000 ; Swedish atlas, 10,000 ; German atlas, 25,000 ; French atlas, 25,000 ; Polish atlas, 5,000 ; 200,000 ordinary descriptive atlases ; 40,000 of the same, census edition ; 100,000 52-page atlas, census edition, reduced, and 23,000 census edition, large type, 64 pages ; that is the total list of publications.

By Mr. LaRivière :

Q. How are these distributed ?

A. We have brought copies of all these for examination, and the prices are marked on them. They are distributed in districts ; they are generally sent, I may say, to persons making application for them, or they are distributed at fairs or wherever we

can reach the farming classes. There is a tremendous demand for literature, especially for this copy book.

By Mr. Blain :

Q. Where are they printed ?

A. They are printed at various places ; some at the Printing Bureau here, and some are printed and sold to us. A great many of these atlases from the United States are printed in Chicago.

Q. Most of the printing is from the United States, is it ?

A. Most of it—the atlases.

Q. Is it done by tender at all ?

A. Of course it is by tender, but they first give us a rough copy, showing exactly what they will do. It is a thing you could hardly ask tenders for.

By Mr. Ross (Ontario) :

Q. The United States is the headquarters for maps ?

A. Yes ; Rand, McNally & Company are the largest concern in the world, I suppose, for the publication of maps.

By Mr. Wilson :

Q. What have you spent on printing and advertising in Great Britain, in Ireland and on the Continent, what in the United States, and what in Canada ?

A. I am afraid you are asking me too much, but I will find out for you.

Q. Mr. Pedley used to give us that.

A. I will get it for you.

Q. Please get us the cost of advertising and printing in Great Britain, Ireland the Continent and the United States.

A. I can give you last year's advertising in the old country now, but not for the United States.

Q. Yes, we would like to have it, and for Canada as well. We know it is pretty large.

By Mr. Ross (Ontario) :

Q. That is a pretty good copy book.

A. Yes, it is in great demand.

By Mr. Wilson :

Q. Yes, I think that is all right.

A. We think so.

By Mr. LaRivière :

Q. Is it to your knowledge that there is a society called 'La Canadienne' ? They have repeatedly asked for pamphlets such as you speak of, and their comunications are not replied to. They not only do not get the pamphlets they ask for, but they do not get an answer at all.

A. In Paris, is it ?

Q. Yes, a society, 'La Canadienne.'

A. I do not remember the letters at all ; it is a strange thing if they do not get an answer from me ; we usually answer all letters. I will inquire into it at any rate.

Q. I wish you would, because I have had two or three communications to that effect.

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By Mr. Ross (Victoria) :

Q. There is no reference about emigrants coming from the United States into Canada ; your remarks have been entirely about Canada ?

A. No, I have been referring, so far, altogether to the work we have been doing in Canada itself.

IMMIGRANT ARRIVALS BY NATIONALITIES, IN 1902.

By Mr. Robinson :

Q. What number of immigrants have come in here this spring ?

A. I can give you that now. The arrivals for the last fiscal year, that is, the year ending June 30, 1902, amount to 67,379 ; of these, 17,259 were British, 26,388 were from the United States, and the balance were Europeans, amounting, I think, to about 24,000.

By Mr. Wilson :

Q. Will you give us the different nationalities ?

A. Yes, I will. Of the British there were 17,259 ; from the United States, 26,388; Galicians, 6,550 ; Germans, 1,048 ; Hungarians, 1,048 ; Austrians, 320 ; Scandinavians, 2,451 ; French and Belgian, 654 ; Russians and Finlanders, 3,759, and a miscellaneous lot of different nationalities, 7,902.

Now, I have a statement here which I might as well give to the Committee now, although it is probably a little ahead of time to mention it. It is a statement of the arrival of the calendar year 1902.

Q. That mixes it up a little, does it not ?

A. We use the calendar year ourselves in our own work, but all our reports, our official reports, are for the fiscal year, and I thought it would be of some interest to the Committee to give them the returns for the calendar year, as well. The total for the calendar year was 84,035. These arrivals were distributed as follows :—Americans, 32,880 ; British, 20,795 ; Galicians, 8,367 ; Germans, 1,302 ; Hungarians and Austrians, 1,894 ; Scandinavians, 2,967 ; French and Belgian, 812 ; Russians, 3,948 ; Finlanders, 1,815, and miscellaneous, 9,257.

Q. Was that for the year ending December 31 ?

A. That was for the year ending December 31, 1902 ?

Q. They did a little better than they have done for the fiscal year ?

A. Yes, the arrivals for the last part of the year were very large.

I will now give you a return of the arrivals for the first four months of the present year, which may be of some interest.

By Mr. LaRivière :

Q. That includes the Barr colony, I suppose ?

A. Yes, that includes the Barr colony.

ARRIVALS IN COMPARATIVE PERIODS OF 1901-02-03.

During the first four months of this year, the arrivals of British emigrants numbered 16,467. It might be well to give you a statement, by comparison, to show what increase there has been in these various classes compared with former years. We have divided them into three classes ; it is impossible to give all the different nationalities at this early date.

During the first four months of 1901 the arrivals of British immigrants numbered 3,217. During the same period for 1902 there were 5,186 arrivals, and for the first four months of 1903, as I have stated, there were 16,457. The arrivals from the United States for the first four months of 1901 were 5,031 ; for the same period in

1902 there were 9,820, and for 1903 the arrivals during that period numbered 13,770. From the continent of Europe there were 5,015 arrivals during the first four months of 1901 ; 7,476 for the same period in 1902, and 10,445 during the first four months of 1903 ; making a total for the first four months of 1903 of 40,672, as against 13,393 in 1901, and 22,482 in 1902. This shows an increase for the British of about 11,300, of about 3,800 Americans, and in the European, that is the Continental, of about 3,000, or a total of 18,000 over the four months of the preceding year.

By Mr. Wilson :

Q. On what terms did Mr. Barr get his colony ?

By Mr. Robinson :

Q. The arrivals last year were 67,400 ?

A. That was for the fiscal year ending last June, but it was 84,000 for the calendar year.

By Mr. Ross (Ontario) :

Q. How many did you say it was for the four months of this year ?

A. 40,672 for the first four months of this calendar year.

By Mr. Wilson :

Q. Can you tell us now about the Barr colony ?

A. In connection with the Barr colony——

THE BARR COLONY,—ORIGIN AND DEVELOPMENT.

By Mr. LaRivière :

Q. You might give us the history of that colony.

A. I will, as well as I can. The Rev. Mr. Barr came to Canada last autumn——

By Mr. Wilson :

Q. Where was his home, when he was at home, heretofore ?

A. I understood it was in London, but I understand since that he had only lived in London a year and a half or two years. I have found out since that he is a Canadian. He came across last year with the idea of organizing a colony of British immigrants, and he came and asked the department for a tract of country to be set apart for him. The department refused to do so ; it refused to reserve any land. Mr. Barr went west, and in about a month or six weeks he returned and pressed very hard for a certain tract of land to be set apart for his colony. He had selected the land, and said that he knew from the correspondence he had that he could make a very great success of his project, and by doing so he would give a great impetus to British immigration to Canada. This was in the month of November, and, after much consideration, it was agreed to set apart a certain number of townships for his colony, some seventeen townships, I think, altogether. These townships were set apart on condition that he would forward to the department by February 15 the names of the persons who were to homestead this land, together with the entry fee, as a guarantee of good faith.

Q. That was the entry fee of $10 ?

A. Yes, the entry fee of $10 each. There was also the further condition imposed, that he was not to charge the people anything in connection with their homesteads ; at least, as far as his services were concerned, they were to be absolutely free. The department would not consent to any reservation, if he undertook to make any money out of the fact that he was getting this reservation made for him.

Mr. Barr went back to England, and in February he produced the names of a great many more people than could be homesteaded on these seventeen townships, and

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he also forwarded to the department the money for their entry fee : the first amount he sent over was, I think, some $4,500. That was in February, I think, about the middle of the month, if I remember correctly—I was away myself at that time. Mr. Barr by that time saw that his party was going to assume very much larger proportions than he had any idea of when he started. He expected at first that if he had three, or four, or five hundred homesteaders, it would be about the size of his colony. But he advertised a purely British colony, to be located in a certain district, and that seemed to attract the attention of the Englishman, and appealed to him in such a way that he got a very large number of applications, and then he undertook to run it upon a very much larger scale than he had contemplated in the beginning. He asked then for certain further reservations, in order that the people who were then applying might get homesteads in the colony, and by that time he had forwarded probably as much more money and as many more names as he had forwarded in the first place to the department ; and he asked us to add a certain tract to that already set apart for his colony. The department agreed to set it apart, but instead of setting apart the whole of the homestead lands in the additional tract, they only set apart or reserved three-fourths of the homesteads for the Barr colonists, reserving the other fourth for Canadian farmers, or American farmers, who desired to settle on them, with the idea that these farmers, who were better accustomed to the ways of the country, being scattered amongst the Barr colonists, would be an advantage to them. This additional land was also set apart on the further understanding that Mr. Barr would put up a certain amount of money, as a further guarantee that this land would be taken up.

By Mr. LaRivière :

Q. Are all the lands in these townships open for homesteads ?

A. No, only the even-number sections. I think there are about 64 homesteads in the township, that is 64 quarter sections that could be taken up.

Q. I understood he was purchasing other lands in the meantime.

A. From the C. P. R. ?

Q. No, from the government.

A. No, he is not purchasing anything from us.

By Mr. Wilson :

Q. Will they reserve the balance of the land for sale ?

A. Will who reserve ?

Q. The government ?

A. No, we do not sell at all. The C.P.R. owns the odd-numbered sections and they sell.

By Mr. Robinson :

Q. Whereabouts is the Barr colony located ?

A. About 50 or 60 miles from Battleford.

By Mr. Roche :

Q. Do you attribute the success of Mr. Barr's efforts to the fact that he advertised it as a British colony alone?

A. I think that fact which was made a feature of his advertisement appealed more to Englishmen than anything else; I do not think there is any doubt of it at all. In his advertisements he said he had so much land set apart for British settlers, and that now was the chance for the Englishmen to go out, and all locate in one place. In addition to that he advertised that he had arranged for the establishment of churches, schools and hospitals, and so on, and as a matter of fact there was a missionary sent out to act with him, the Rev. Mr. Lloyd, and a very fine man he is.

By Mr. Ross (Ontario):

Q. They had their doctors too ?

A. Yes, and they brought out some nurses as well. Now, that is the history of the beginning of the Barr colony.

By Mr. Wilson :

Q. He made nothing out of the government in any way ?

A. The government paid him nothing at all.

Q. But the steamship companies paid him something ?

A. Yes, I believe they did. I believe his office in London, he ran a pretty extensive office there for a few months, was really a steamship office, and I believe that he made arrangements with the Elder-Dempster Company for a commission.

By Mr. Ross (Ontario):

Q. It would not concern your department in any way ?

A. No, it would not concern us. All the money Mr. Barr has got out of it for the management of his office, and for his own services is the amount of commission paid him by the steamship companies.

By Mr. Wilson :

Q. Can you tell us how much it was ?

A. I cannot tell you.

Q. But you have heard, have you not ?

Q. Yes, I have heard that it was about $12,000, some 15 shillings a head.

By Mr. Robinson :

Q. Did Dr. Fry, the headmaster of the Birkhamstead school apply to you for anything ? Any tract of land ?

A. I never heard of it.

By Mr. Ross (Ontario):

Q. Have we got through with the Barr colony ? Have you given us the history of it ?

A. As far as I can give you at present.

Q. How much country do they extend over ?

A. Perhaps altogether between 50 and 60 townships.

Q. They do not occupy the whole of it, of course, the C. P. R. own the odd sections ?

A. Yes, or they did, I do not know whether they do now or not.

By Mr. LaRivière :

Q. Do you know whether the C. P. R. has sold any of that land ?

A. I cannot tell you that; I understood they have.

Q. How many of those immigrants that came out under Mr. Barr's protection have returned to the old country ?

A. I am not aware that any have returned.

Q. Oh, a large number have: are you not aware of it ?

A. No, I am not.

By Mr. Ross (Ontario):

Q. Would your agents have knowledge of that ?

A. Yes, I think we can get that.

Q. They have not reported that ?

A. No.

Q. That is you do not know officially that they have returned ?
A. No, I do not.

By Mr. Wilson :

Q. Officially you are dead on that question ?

By Mr. Ross (Ontario):

Q. Is that colony going to be a success ?
A. It depends upon itself.
Q. Does it look like it ?
A. I do not see why it should not be a success. If you will permit me I will tell you what the government has done in connection with that colony.

We recognized the importance of doing everything we could, at all events, to make the start of the colony a success, although it was only a small number compared with the total number coming from England, not one-tenth of those coming from the British Isles. The others were never heard of, that is there was little attention paid to them by the press and the public.

By Mr. Richardson :

Q. What is the total number of the colony ?
A. About 1,900, I think. But we recognized the necessity of making this thing a success; they were going a long way from the railway, with a prospect of course that the road will be built there within a year or two years, at all events. The government undertook to make their reception, or their first impressions rather, as favourable as possible, by looking after them very carefully, by seeing that comfortable accommodation was given them on the train, a good reception when they arrived and all that sort of thing so that they would be favourably impressed. We also made arrangements to have our chief colonization officer at Saskatoon to direct matters, and we employed in addition two farmers, men of large experience in the west, and who were well qualified to impart instruction to these people. I might say in connection with that, that while they were at Saskatoon they had a meeting at which these farmers made addresses, direting them how, and what implements they should buy, what class of horses, what class of harness, and what things they required to make a beginning, and they began immediately before the party even left Saskatoon, to direct them, so that if they were willing to follow the directions given them they could profit by it.

By Mr. Kidd :

Q. That would be farmers that had been out there for some years ?
A. Yes, these farmers that we engaged are experienced men, who are well qualified to direct and advise them what they should do. In addition to that, we had land guides, who were to do anything they could to help these people, so that right from the start we endeavoured to show them that we were ready to help them, and at the same time we wanted to help them for our own sakes as well. That was the way we went about it. In addition to that, we arranged, when they were to drive west, for large tents to be put at different locations, twenty miles apart, with a supply of hay and wood, &c., for them, so that when these people arrived after a day's journey, they would not have to hunt all over the country for a little bit of wood, or look for hay for their animals; it was all provided for them. In addition to that, we appointed a sub land agent for that particular purpose, and sent him along with them to direct and advise them, and take their homestead entries, when they were ready to make them.

By Mr. Roche :

Q. Do you say you had all the names of these people beforehand ?
A. Yes, we had them all before they came.

Q. In what position would those people be that remained in Winnipeg or went to work elsewhere, with reference to their entry fee ?

A. They left directions, many of them, I believe, to have the land entry made for them ; but even if they did not leave directions, the money stands to their credit. They are not obliged to go with the colony : they can go elsewhere, if they choose.

By Mr. LaRivière :

Q. The fees are there, but the location is not made ?

A. We have the fees, but the location has not been made yet.

In addition to that, it was learned, while they were at Saskatoon, that quite a few of the young men had not any money, and arrangements were made to provide work for them.

By Mr. Kidd :

Q. I suppose there were a great many tradesmen among them ?

A. Oh, there were all sorts of men.

By Mr. Stewart :

Q. Some of them are working at Saskatoon, and some are at other places ?

A. Oh, yes, they can go wherever they like ; they are not bound to stop with the colony.

Q. I believe it is better for them.

A. Each man is on his own responsibility, and as far as Mr. Barr is concerned, he is not an officer of the department. We do not recognize him in any way, except that we think it is policy and advantageous to work in conjunction with him, until we see he is unworthy of our consideration.

By Mr. Wilson :

Q. You cannot anticipate that with a clergyman ?

A. No, we cannot at all.

Q. How many officers did you have with them ?

A. I cannot say just now, speaking from memory. In addition to that, we had two surveyors, who had gone out to locate the lots. We found that a good many posts were burnt in that district, and we have arranged for two more to go. That will make four surveyors, two farmers, and a man to take entries, and about six land guides, and the sub land agent, and Mr. Speers, when he is there.

Q. That is about fourteen altogether ?

A. Yes.

By Mr. Roche :

Q. Most of these colonists are from the city, are they not ?

A. I cannot say ; they are from all over the country.

Q. I hear most of them are.

A. That may be ; I do not know.

By Mr. Blain :

Q. Did the Canadian Pacific Railway lend any assistance for the settlement of that colony ?

A. In what way ?

Q. It would be of very great advantage to them in the increase of the value of their land, I suppose.

A. They did everything they could to assist them in the proper settlement of the colony, of course, but they took no responsibility. I think they did arrange with regard to some horses and oxen, to have them there for transport for these people, which we did also as well ; we provided a share of the transport.

Q. Was there any truth in those newspaper reports about Mr. Barr taxing them for certain things ?

A. I know nothing about it, except the report which I have seen in the newspapers.

By Mr. LaRivière :

Q. I think it was all very well for the department to look after these immigrants, but I think there ought to be an investigation in order to avoid a repetition of the difficulty. There was a great deal of complaint on the part of these immigrants, in fact they had an indignation meeting, and complained very bitterly of being overcharged on goods sold to them by the agent of the colony. They said they had been overcharged in the rate, and besides that they had been given inferior accommodation on the ship to that for which they had paid and which they were entitled to. There were a lot of complaints in that direction. I believe it was the duty of the department to investigate all these matters and prevent their repetition. Under these circumstances, these poor people must be looked after; they have been misled in some instances, but if they are properly attended to they will become very good settlers in the long run. Of course, they have to be educated to the ways and needs of the country, but when that is done, I am satisfied they will become very good settlers, but it is unfortunate they should have been deceived at the start.

A. Well, I do not know where the deception came in ; there is no deception so far as we know.

Q. I do not blame the government at all in this matter. There must be something in it, but I do not say the department is responsible. It should be investigated and exposed, so it will not recur either through these people who settle colonies or these settlement companies we now have in the west.

A. We have our officers there now, and if there is anything in the way of imposition practiced or attempted to be practiced on these people, we propose to deal with it.

Q. It ought to be known publicly if there is, because we do not want any of these things being repeated over again.

A. We quite agree to that.

By Mr. Richardson :

Q. Do you think that, Mr. Barr, being a Canadian, these people connect him with the government ?

A. They are beginning to understand the distinction, and they commend the government for what it has done for them. In the reports we have got they criticise Mr. Barr and commend the government.

By Mr. Wilson :

Q. The people generally who are coming in, are they pretty well satisfied ?

A. We hear no complaints at all.

Q. Are they applying in any large numbers for homesteads ?

A. I was going to give you an idea of the number of homestead entries in a few moments.

By Mr. Blain :

Q. Mr. Smart, before you leave that Barr colony item, will you tell the committee whether any statements about overcharges for goods have been reported, and indignation meetings there ?

A. Yes ; we have full reports, but nothing definite as to overcharges ; that is hinted at.

Q. What is the chief ground of complaint of the settlers against Mr. Barr ?

A. The chief ground since the colony arrived is against the steamship people, that Mr. Barr deceived them as to the accommodation on board ship, and they have not got over the fact that they were badly treated on board the ship.

Q. As far as you know, are the settlers and Mr. Barr living in harmony ?

A. As far as a proportion of them are concerned, they are not. Only yesterday, I gave orders to Mr. Speers, our colonization agent, to go to Battleford and ascertain the true facts, and take whatever steps he thought necessary to have things go on well. We can manage them without Mr. Barr just as well as with him.

By Mr. LaRivière :

Q. These people were to have their own stores, and, as these were not organized when they arrived, did not they go to the local storekeepers and offer them patronage on condition that 10 per cent would be paid over to the managers of the colony ?

A. That was reported, but I understand that Mr. Barr denied that *in toto*.

Q. Yes, but all the storekeepers have statements to the contrary.

A. Not all ; I think probably those which did not get the business raised the cry.

Q. Then, you infer the others paid the 10 per cent ?

A. I do not know that, but I know Barr denied it at the time.

By Mr. Robinson (Elgin) :

Q. Mr. Smart, are these men breaking up the land ?

A. They are just locating now. They have a large lot of tents on their own lands over the country.

By Mr. Wilson :

Q. How are they going to get along in the winter ?

A. There is quite a lot of timber available there, and they will have some log houses. We have men directing them.

Q. Is there timber near them ?

A. Along the river, within easy reach

By Mr. Blain :

Q. Have these men any amount of money, or have you any knowledge of that ?

A. I do not know, but we understand they have.

By Mr. Thomson (Grey) :

Q. They have a good many pianos ?

A. Yes, a good many.

By Mr. Ross (Ontario) :

Q. How do you distinguish between immigrants and visitors to our shores ?

A. Well, it is sometimes pretty hard to distinguish between them.

Q. Well, we will say, immigrants ; is everybody coming in classed as immigrants?

A. No.

Q. Well, what difference do you make ?

A. We have returned Canadians in our list, who are not included ; then, we have tourists and first cabin. Only second cabin and third class are included ; the first cabin are not considered.

Q. Then, second cabin and steerage and tourists would be considered immigrants ?

A. Second cabin and steerage.

Q. Has a person to declare himself an immigrant to be classed as such ?

A. I do not think it is necessary to declare it.

Q. Would they declare it to the steamship company : would they declare that they were emigrating to Canada ?

A. No.

APPENDIX No. 2

By the Chairman :

Q. They would not get the special rate, unless they did declare themselves ?
A. They do not get a special rate ; there is only one rate for steerage passengers.
Q. Is that so ?
A. The third-class ocean rate from Great Britain to Canada is $25.50.

By Mr. Wilson :

Q. First cabin you do not count ?
A. No.

By Mr. Kidd :

Q. The ocean rate is $25.50 ?
A. $25.50, and they all get the through rate to Winnipeg of $12 from the ocean port.

IMMIGRATION FROM THE UNITED STATES.

By Mr. Ross (Ontario) :

Q. Do you count any coming in by rail that would be immigrants ?
A. They all report at the seaport.
Q. But coming in by rail from the United States ?
A. There are a good many arriving we do not know of. A great many drive in. If they report at the customs—which nearly all do ; they understand it is necessary—we get the returns through the customs officers.

By Mr. Wilson :

Q. I fancy you have them all recorded that stay with us, and many more.
A. They are all reported.
Q. We had an investigation here a year or so ago, which we thought would make quite a discount ; we could not account for all who were said to have come in.

By Mr. Roche (Marquette) :

Q. They get a reduced rate from the Western States, do they not ?
A. Yes, they get a rate of a cent and a-half a mile, I think it is, from the Great Northern.
Q. In order to get advantage of the reduced rate from the United States, have they to make a declaration ?
A. Yes, coming from the States.

By Mr. Kidd :

Q. And eastern Canadians cannot get that rate ?
A. No.

By Mr. Thomson (Grey) :

Q. In addition to that, does not the Canadian government give some assistance to immigrants from the Western States ?
A. No.
Q. In the way of passage ?
A. No.
Q. Or commission ?
A. No ; we give a commission to the agents.
Q. The government then contributes nothing to these immigrants from the Western States ?

A. No ; we give nothing at all in the way of transportation to any immigrants. The only exception we made in the past year was in the case of the Welsh Patagonians —and that only amounted to commission after all—where we allowed this to the committee in Wales who were forwarding the immigrants from Patagonia.

By Mr. Wilson :

Q. How many were there ?
A. 250.

By Mr. Robinson (Elgin) :

Q. Where are they settled ?
A. I was going to say in regard to this matter of other settlements, that they are at Saltcoats.

By the Chairman :

Q. South of Saltcoats ?
A. South of Saltcoats, yes.

By Mr. Robinson (Elgin) :

Q. How are they doing ?
A. They are doing fairly well.
Q. Have they needed any help ?
A. Yes, we have helped them a little this year.

By Mr. Wilson :

Q. In the way of a loan ?
A. We advanced them seed.

By Mr. Robinson (Elgin) :

Q. They are farmers by occupation ?
A. Yes.
Q. They come from South America ?
A. They are members of a Welsh colony which settled in Patagonia. Some of them are really Patagonians—some of the younger ones who were born there.

By Mr. Wilson :

Q. There are some there still ?
A. Yes, some of them are fairly satisfied. Where they got into a good district they did well.
Q. Did not a lot talk of coming to Canada ?
A. Yes ; 1,500 or 2,000 talked of it, but it was found impossible to move such a large number, and it was found difficult to raise the money among the wealthy Welshmen at home to transfer them. You see they have to be taken to England from Patagonia first, and then transferred to another steamer to come here, so it is quite a large expense to move them. The first proposition was to charter a ship and bring out every one who was willing to come—it was thought that possibly 1,000 of them would leave—but it was found after sending one of our agents down along with an influential Welsh gentleman that to get that number was an impossibility.
Q. Do you not expect any more ?
A. A few are coming from time to time.

By Mr. Robinson (Elgin) :

Q. Did not the British government do something ?
A. No. Then in addition to these colonies I have enumerated, we have other colonies. We have a German Catholic colony in what is called the Hoodoo Plains.

That is a district situated between Yorkton, at the terminus of the Canadian Pacific branch—though I do not know whether it is still the terminus——

By the Chairman :

Q. No, the Canadian Pacific have built 40 miles more.

A. Well, anyway, the Hoodoo Plains district is situated between Yorkton—about half way between Yorkton and Rosthern. It is a very fine district. These people were brought in by this Saskatchewan Land Company. They sold them a very large piece of land, I fancy, at a reasonable rate in order to start the movement, and afterwards these people have come in themselves and have taken up homesteads.

By Mr. LaRivière :

Q. Is there much land left there favourable for homesteading ?

A. Yes, sir, I think so.

Q. Has not that company bought some land grants ?

A. The land grant of the Long Lake road.

By Mr. Wilson :

Q. Do you approve of locating settlers according to nationalities in colonies ?

A. No ; but it is a very natural thing, where a body of people have lived together, for them to wish to locate together, and while I think the plan is not a good one in the long run, while I think it is far better for all classes to be mixed, yet it is a very natural thing, and it is pretty nearly what most of us would do if we were going to live in a foreign country where no one else spoke our language.

By Mr. LaRivière :

Q. It goes a long way to induce people to come.

A. I think it is far better to have them separated where possible.

By Mr. Wilson :

Q. It keeps them for a long time from becoming Canadians.

A. There is no question about that, but it is a very difficult question to deal with.

By Mr. Roche (Marquette) :

Q. You did not think we would have much difficulty with the Doukhobors if they were in colonies ?

A. We were badly advised with regard to them. We might as well have had them separated all over the country as not.

DOUKHOBORS AND DUNKARDS, AS SETTLERS.

By Mr. Wilson :

Q. Have they homesteaded much, the Doukhobors ?

A. Nearly all of them. You will not find it in this report.

Q. Why not ?

A. Because they homesteaded this year.

Q. They homesteaded in 1901 ?

A. No.

Q. Well, the minister must be mistaken. You give a report to the effect that in the last years three homesteaded, but last year none. I asked that question the other day. This is in the *Hansard* of March 25, and Sir William Mulock answered that in 1900 none of them homesteaded, in 1901, 62 and in 1902, 207. Now, I have diligently looked in your report. In 1901, I can find no account of it in the place where the others are, and in 1902 only three. It is very misleading.

A. I cannot understand that. Does it give the number this year ?

Q. No, because it was not asked for.

A. There are about 1,800 this year.

Q. They have given up that idea of holding land in common solely.

A. Yes, they have all taken up homesteads.

Q. I am very sorry that the books do not agree, because it is very misleading.

A. A statement of this kind was submitted by the officer of the department, and I will question him about it. Then we have another new colony that is coming in from Indiana. These people are together, but of course they speak English. These are German Baptists who located within the last century in Ohio and Indiana, and they are a very large and influential body of people there ; no better class of citizens can be had. We have been endeavouring for years to make a start amongst these people, in order to make a beginning for a settlement and at last have succeeded. Many of them have been crowded out. We have known for years that they have been crowded in Indiana and would have to move to some other point. Up to the present year they have been induced to go to Minnesota, North Dakota, and I think Montana, so we have not been able to secure even a foothold amongst them up to the present time. I think about one hundred have registered entries south of Indian Head.

Q. What is the name of the colony ?

A. Dunkards.

The CHAIRMAN.—The Dunkards are very desirable people.

By Mr. Ross (Ontario) :

Q. Are they a community ?

A. Yes.

Q. They are not like the Uneidas or the Shakers ?

A. No. They are from Indiana.

By Mr. Robinson (Elgin) :

Q. I had a letter from a man in Montana stating he wanted to settle in Alberta.

By Mr. Thomson (Grey) :

Q. What is the peculiarity of their religion ?

A. They are German Baptists.

Q. I suppose that would be a good country for them. There is lots of fresh water there.

A. Yes.

By Mr. Blain :

Q. Why are they being crowded out ?

A. They are farmers, and no fit places offer for their children. One of their delegates came to Ottawa, and they spoke English. I do not imagine that any of them speak their mother tongue at all, although they may, of course.

Mr. RICHARDSON.—We have some in Ontario, and they are careful and successful farmers. We have a settlement of them near Markham.

The CHAIRMAN.—Between Markham and Pickering, I remember, and they are a good class of people.

The WITNESS.—I will now take up the Doukhobors.

By Mr. Wilson :

Q. You have had a good deal of trouble with them last year. A lot of them went out on the march, and this spring another lot, and the worst feature of it is, that a

number of them have been attending meetings where the men and women both go in a nude state, as far as I can learn from the newspapers. I saw it in the Toronto *News*.

The CHAIRMAN.—They are all very bad boys, those newspaper men.

The WITNESS.—In connection with that, I suppose every one connected with the Committee knows how the pilgrimage started last year by a few hundred of these people was wound up. We heard nothing more of them until this year. In the meantime, one of the leaders of the Doukhobors, who had been an exile for sixteen years, arrived in Canada, a man of much more than ordinary intelligence and ability, and he went amongst them and has taken up all these questions, where they have undertaken to object to anything that the government wished to impose, like the matter of taking up homesteads, the registration of births, marriages and deaths, marriage laws, and also the question of the working of their animals. He has gone amongst them and taken the opposite position to that held by some of these people, because you must remember that, after all, it is only a small proportion, a small minority, who have adopted these peculiar ideas in respect and with regard to the land and perhaps to registration ; but so far as turning their animals adrift, and this pilgrimage is concerned, there were only a small proportion—I think, sixteen hundred men, women and children, all told, in the first pilgrimage. Of course, the women and children had to go with the men. There were about four hundred or four hundred and fifty men.

By Mr. Wilson :

Q. That is a good number.

A. But that is out of nearly six thousand. At any rate, this man went amongst them and has, I think, succeeded, perhaps not altogether, but very largely, in changing their views, in having them change their views with regard to these various matters, and I am inclined to think his presence there will do very much to make these people understand and believe that what they have been advised by the government to do has been the proper thing for them to do. There does not seem to be any doubt about that at all now. Through his influence, this large number of persons, some 1,800, have taken up homesteads this year.

By Mr. LaRivière :

Q. Do you mean to say, the government is giving them a course of theology ?

A. No, the government has not done that exactly.

By Mr. Ross (Ontario) :

Q. Do they not quote Scripture for whatever they do ?

A. I do not know that they do.

The CHAIRMAN.—Yes, they do.

Mr. ROSS (South Ontario).—They told me, in the west, last year, they could do that for everything.

Mr. RICHARDSON.—They have been religious fanatics for two hundred years.

By Mr. Ross (Ontario) :

Q. You say there are six thousand of them ?

A. Near Yorkton and Swanton.

Q. Are they all settled together ?

A. No, they are in villages, in two lots. They are at Kassala, the Swan River district, and Yorkton. Then, there is the Prince Albert settlement. They are pretty well scattered.

Q. That is in the Edmonton section ?

A. No, west of Prince Albert. They are west of Rosthern.

Q. Where did the difficulty occur ?

A. In the first case, at Yorkton. In this last outbreak, which was closed out very quickly, the trouble was in the Prince Albert district.

By Mr. Kidd :

Q. Are they industrious ?

A. Oh, very. If one goes amongst their villages, one cannot but be struck with the way they keep their places. They have their whole village like a garden, outside the houses, and they have the land broken up in tremendous quantities. They have worked very hard.

The CHAIRMAN.—They are in my constituency, and while I do not know them as well as I ought to, I know that they are very industrious. They collected the senega root to the value of $4,000, and sold it in Yorkton, and bought winter supplies of groceries. This was done by the women, and is a thing that was never thought of, except by squaws and half-breeds.

By Mr. Wilson :

Q. I would like to ask if they have repaid the loan you made to them when they first came ?

A. No.

Q. You said you had taken security on the land ?

A. We hold liens on the land. They have made the statement, that they would return every dollar the government ever advanced them.

By Mr. Boyd :

Q. You referred a moment ago to the question of the registration of births, marriages and deaths. I would like to ask what percentage of them are now married ? Are they adopting that custom in Canada ?

A. I do not know what percentage. I cannot tell that, but I know they are perfectly satisfied with the arrangements.

By Mr. Wilson :

Q. They have a form of marriage of their own. They have always had.

A. They have a ceremony of their own, but I do not know if the North-west government has agreed to some special arrangement with them.

Q. Are they allowed, as when they first came, to put their wives away ?

A. I do not know how far that prevails at all. There is not a great deal in that.

By Mr. Blain

Q. Was that agitator responsible for the two outbreaks ?

A. No, that was the first one.

Q. Which is the one which went out last ?

A. You are thinking of Zebroff, John the Baptist. He was leader first. In this last case it was at Prince Albert. Three men went from Yorkton to Prince Albert and got up a crowd to start on a march. Our officers were on hand as soon as they heard what was contemplated, and they simply told them that it would not be permitted. They took the people all home, except these three—sent them home from Saskatoon. They were satisfied to go back. The people in the Saskatchewan district are well-off. They have made tremendous progress, from the statements I have received. The people in the Yorkton district have not been so successful. As is known, they abandoned their animals last fall. They were collected and sold for them by the government ; and, after charging up the expenses of that pilgrimage—it was not really a large sum—the government gave them the balance. When this celebrated exile returned, Peter Veregin, they decided to buy horses and start over again, and the money has been used for that purpose.

APPENDIX No. 2

By Mr. Wilson :

Q. But is the land as good at Yorkton as elsewhere ? I am told not.

A. Oh, yes ; the district in which Yorkton is situated is one of the best in the country for farming purposes.

By Mr. Blain :

Q. Is this leader you speak of in the employ of the government ?

A. Peter Veregin, you mean ?

Q. Yes.

A. No. Mr. Speers reports to the department, under date of April 13, regarding these people. After Veregin had consulted with these people, they decided they would buy stock.

By Mr. Kidd :

Q. And commence again ?

REPORT BY MR. SPEERS ON DOUKHOBOR SETTLEMENT.

A. Commence again, practically. Mr. Speers says :

'OFFICE OF THE COMMISSIONER OF IMMIGRATION,
'WINNIPEG, MAN., April 13, 1903.

'SIR,—I beg to report that the Doukhobor committee spent a few days in Winnipeg last week, and, at their request, I assisted them in selecting some very high-class stock for their colonies at Yorkton and Saskatchewan, to replace the animals that were discarded last fall. They purchased the best horses in the country. They bought 20 horses in one lot for $4,072, 15 in another lot for $2,626, and two for $440, also four high-class stallions for $2,450. They paid cash for all this stock, which amounted to about $10,000. In addition to these, their brethren in Saskatchewan presented them with 38 good horses and $8,000 in money, so that the district is well equipped with a better class of horses than can be found in any other community. These people are dressing like ourselves. They have expressed a desire, also, to conform to our customs. They are observing our holidays, they are accepting our calendar, and even Zebroff, the leader of the pilgrims in Swan River, is among the committee, and is bringing about this marked progress. Peter Veregin is a man of superior judgment, and his influence is very great among the people. The Doukhobors will yet be considered among our most progressive settlers, and by accepting all our regulations will be a very desirable community. They are making excellent progress.

'Your obedient servant,

'(Sgd.) G. W. SPEERS,
'*General Colonization Agent.*

'W. D. SCOTT, Esq.,
'Superintendent of Immigration,
'Ottawa.'

I see, in some other correspondence, they are not only doing that, but adopting English names. All the children who are being born there are being given English names—James, Thomas, William, and so on.

By Mr. Thomson (Grey) :

Q. None of them named Sir Wilfrid, of course ?

A. Not yet.

By Mr. Roche (Marquette) :

Q. Are these the private opinions of Mr. Speers, as well as his official opinions ?

A. They are the opinions of the department.

Q. I think these are not his private opinions.

A. They are the opinions of the department.

Q. Was not a certain day fixed for them to make homestead entries, and did not the Doukhobors refuse to do so, and the time was indefinitely extended ?

A. I can tell you, in explanation of that, how that idea is abroad, maybe. We have endeavoured for four years to get these people to make entries. We have not made any threats, but we have tried to get them to make entries by telling them that if they did not do so at such and such a date, we would throw the land open.

By Mr. Kidd :

Q. But these were not threats ?

A. No.

Q. They were not staked out ?

A. No. We set apart a large tract of land for them in the first place, with a sufficient number of homesteads to meet the whole community.

By Mr. Smith (Wentworth) :

Q. Have they worked outside of the villages at all ?

A. No ; I cannot say, I am sure. The way that idea is abroad is on account of our action. We have from time to time been fixing a day and trying to get them to take up the land, by saying we would throw it open, but it had no effect till Veregin went in and induced them to comply with the wishes of the department.

By Mr. Kidd :

Q. Would each one know their own homestead ?

A. Yes. Sufficient land was allotted for all and staked out.

By Mr. Smith (Wentworth) :

Q. They are taking them up now ?

A. Yes, about 1,800 have been taken up this year, and I think that covers the whole crowd.

By Mr. Kidd :

Q. Is it a fact that the Doukhobors do not permit their daughters to go out to service ?

A. That is not quite true. I know not a few Doukhobor women who are working in service.

Q. I understand, they differ from the Galicians in that respect.

A. I know that is the general impression, but, nevertheless, it is the fact that a good many have gone out to work in service. The Galicians are satisfied to send their daughters out to take places, and it has been a great relief to the housekeepers of the west to get them.

APPENDIX No. 2

HOUSE OF COMMONS,
COMMITTEE ROOM 34,
FRIDAY, May 29, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10.45 o'clock A.M., Mr. DOUGLAS, Chairman, presiding.

Mr. JAMES A. SMART, Deputy Minister of the Interior, was again present by request of the Committe, and examined, as follows:—

By Mr. Wilson :

Q. I would just like to ask Mr. Smart a few questions before he continues his statement. In your report to us, at the last meeting of the Committee, you told us that the Barr colony made some nineteen hundred and odd entries for homesteads.

A. No, I did not.

Q. I think your evidence says so.

A. No, I made the statement that Mr. Barr had sent to the department a number —I do not think I gave any number—but he sent to the department some $21,000 or $22,000, to be applied to homestead entries. He sent the names, before that, of some 1,400 or 1,500 entries ; but, of course, none of them have been made yet.

Q. It is immaterial ; I want to find the population he brought out.

A. The number of people on board the steamship with him was in the neighbourhood of 1,950. In addition to that there was a small number came out on a steamer previously, and some followed later.

Q. And didn't they apply for homesteads ; didn't he send money ?

A. For 2,100.

Q. But not located yet ?

A. They are not located yet.

Q. I want to find out if we have any agents in Austria, Hungary, Prussia and Armenia ?

A. We have no agents, except the syndicate of steamship agents, who do all our work on the Continent, except in Armenia ; we have no agents there.

Q. Are they allowed to solicit emigration for any countries in those countries ?

A. Not directly.

Q. I thought so. I see, in the *Citizen* this morning, a report that from these countries there had arrived 2,899 in one steamer.

A. Yes, European immigrants.

Q. Well, these are from these countries, it was reported, and I was anxious to see how we got them.

A. I have not seen that report at all.

Q. It is here.

A. They are practically all from Austria, Prussia and Hungary ; they cannot be from Armenia.

Q. We have no agents in Armenia ?

A. No.

Q. Nor in the other countries ?

A. We have, but it is in an indirect way. We do not know what they are doing.

Q. You do not know what they are doing ?

A. No, we do not, and we do not want to know. I want to make an explanation as to the amount Mr. Barr received in connection with the organization of his colony.

I may say, I made no statement as a matter of fact, because I was not aware of any amount paid to him, although I said he received $12,000 in steamship bonuses.

Q. You explained that before.

A. I do not want to leave the impression on the minds of the Committee that that went into Mr. Barr's pocket. Mr. Barr had an office in London which, I am satisfied from what I saw of it, would cost the whole of the amount he received in steamship bonuses. I just want to make that statement, and also in regard to the statement made in the newspapers, or in one newspaper, at any rate, that Mr. Barr was an agent of the government. He was not an agent of the government ; he was not authorized to receive any commission, bonus or anything else in any shape, and no arrangement was made with him to act as agent.

By Mr. LaRivière :

Q. Did he not get $5 a head ?

A. No.

Q. It was reported he did.

A. That is not so.

Q. There is no truth in the statement ?

A. No truth at all.

By Mr. Sproule :

Q. Did he not get $10,000 for some purpose ?

A. I said last week that he received $12,000, as being the agent's commission from the steamship company, the Elder-Dempster Company, which carried most of the immigrants.

Q. From the steamship company ?

A. From the steamship company, just the same as any other agent would have received it, except that it was a large party and he received a large amount ; but I think it cost him all that amount to carry on the work in the old country before the party sailed. In fact, I do not know but what his office is still open and doing business. He had a large office, employed a large staff there, and did much advertising.

By Mr. Wilson :

Q. I think he is no longer at the head of the colony ; did they not put him out ?

A. He has resigned.

Q. That is, he consented, at their request ?

A. I suppose he did. I was asked to furnish some statements last week and some explanations.

Q. That is about printing and advertising ?

A. No, the first is an explanation in regard to a question asked by Mr. Wilson in the House, as to the number of entries granted to the Doukhobors. I may say, that the figures given in the House were for the calendar year, and it is so stated in the reply.

Q. There were none reported in 1901 ?

A. Have you the report there ?

Q. Yes, here is one. I mean, entries for homesteads in the regular table.

A. In 1901 ?

Q. Yes, that is what I said.

A. This is up to the end of June, 1901.

Q. Well, how does that make it any better ?

A. Because the return given in the House is up to December 31, 1901.

Q. Then, explain the next year.

A. For 1902, you have the book there ?

Q. Yes, I have it here; here it is.

APPENDIX No. 2

A. In the statement there it shows—I may explain this and draw your attention to the fact that there is a printer's mistake in the way this is put into the report. You will see here, under the heading 'Russians (other than Mennonites, Poles or Doukhobors)," there are 184. These 92 should have been opposite Mennonites, instead of having been bracketed in with 184. Then, there are 7 Poles and 116 Doukhobors.

Q. Not in this list ?

A. Yes, and Chinamen, 3.

Q. Oh, I see.

A. That is the way it should be : the figures were pushed up in the printing This count is for the fiscal year, and the statement given in the House was for the calendar year.

Q. I think any one reading that would take the same view of it that I did ?

A. They would ; it is certainly misleading.

Q. But your explanation does not account for the whole return, I do not think ?

A. I do not see why.

Q. You do not see why ? Well, you add them together, and see whether they amount to as much ?

A. There were no Doukhobor entries in 1900 ; there were 62 in 1901, that is the calendar year——

Q. Well ?

A. And for the year 1902 there were 207.

Q. Well, what does that make altogether ?

A. 269 up to the end of 1902.

Q. Does the report show that ?

A. The report shows to the end of December ; the departmental reports are to the end of June.

Q. The return for 1901 shows 62, and for 1902 shows 207. That is to June 30 ?

A. No, it is up to the end of December, in each year.

Q. I do not see how that is.

A. It states that in the reply given in the House ; it shows the calendar year, unless a question is asked regarding the fiscal year.

Q. Well, Mr. Chairman, it is so recently that we changed the year in the Interior Department, to comply with the other departments, that I expected we would get a return to correspond with the report. I think that is reasonable ; but they put in a word or two that is not in the question as you put it, and, unless you are careful, it misleads you.

By Mr. Clancy :

Q. Perhaps Mr. Smart will tell the Committee why the report is made for the calendar year, when the estimates in the House are for the fiscal year ?

A. The reports are all for the fiscal year.

Q. Why is that ?

A. This is an answer to a question put in parliament.

Q. I am not discussing the question between you and Mr. Wilson, but why the department persists in making a report which does not correspond in time with the estimates we discuss in the House.

A. The official report is for the fiscal year.

Q. Not all your reports.

A. I think so. There may be some suggestions there bringing it down to date.

Q. Well, take this here in your report : 'The following table shows the total annual immigration from 1897 to 1902, inclusive, classified according to the various countries from which the same is derived.' Then it goes on to give the arrivals from the various countries from 1897 to 1902, inclusive.

A. Because up to that time our returns were all for calendar years ; we altered it after.

Q. That is for the purpose of showing a comparison ?

A. Yes. We gave one-half the year there, where we make a change.

EXPENDITURE ON PRINTING AND ADVERTISING.

There is another statement of the cost of printing and advertising in the United States, British Isles, the continent of Europe, Iceland, special New Ontario, and expenditure made in Canada.

A. Yes. We gave one-half the year there, where we make a change. There is another statement of the cost of printing and advertising in the United States, British Isles, the continent of Europe, Iceland, special New Ontario, and expenditure made in Canada.

By Mr. Wilson :

Q. Yes, give us that.

A. In the United States the cost was $70,664.41.

Q. What does that cover ?

A. That covers advertising and publications of all kinds.

Q. Have you a list of them there ?

A. Yes.

Q. It is all submitted ?

A. Yes.

Q. The list will go into the report ?

A. Yes, everything. The cost of printing and advertising in the British Isles was $62,923.35 ; on the continent of Europe——

Q. Well, in that, I suppose, you did not publish any pamphlets ?

A. Yes, a great many were sent from this side.

Q. Have you a list there ?

A. There are a great many. The cost of the printing and advertising on the continent of Europe was $4,594.88, and in Iceland, $2,087.28.

Q. That work was not done there—no publications, I mean ?

A. No, sir.

Q. They were sent there ?

A. Some newspapers were.

Q. No pamphlets ?

A. Some special editions of newspapers were sent across there. Then, the cost of the special New Ontario printing and advertising was $5,244.52, and the expenditure made in Canada was $4,144.57, making a total for advertising and printing in 1901-02 of $149,759.01. I might explain here, in connection with this statement, that in the publication of atlases—we publish them in the English, German, French and Swedish languages—they are all printed in Chicago. We have there nearly half, or about half, of these books which are sent to the old country, and we have to divide the expenses.

Q. Then, the reading matter is altered in the maps ?

A. No.

Q. I mean the names on them ?

A. No. We have copies of them, and can show them to you, if you wish.

By Mr. Sproule :

Q. You say they are all printed in Chicago ?

A. The atlases are. This is one of the chief books we use everywhere. This is the statemet in detail, as it has been prepared in the department :

APPENDIX No. 2

STATEMENT OF AMOUNT EXPENDED FOR PRINTING, ADVERTISING, PAMPHLETS, &C., FROM IMMIGRATION VOTE DURING FISCAL YEAR, 1901-02.

Name.	Service.	Amount.
United States.		$ cts.
Der Nordwesten, Winnipeg	Subscription for 1,000 copies, 1 year, $1,500; advertising, one year, $1,000 and 20,000 copies special issue, $1,000 and advertising, $23.33	3,523 33
Mennonites Publishing Co.	Advertising in Rundschau	20 00
Manitoba Free Press	110,000 copies special issue, $5,500; advertishing 9 months, $712 47 and advertising *re* labourers, $18.30.	6,228 77
Western Publishing Co., Brandon	70,000 copies Hard Wheat Belt, $2,012.50; advertising Homestead Regulations, 5½ months, $135; advertising *re* labourers, $8	2,155 50
Western Canada Press Association	Grant	2,000 00
Toronto Star	5,000 copies New Ontario edition, $500	500 00
Virden Advance	15,000 copies special issue	750 00
Rudolph Bach	Grant for writing articles	25 00
R. C. Mitchell, Duluth	Advertising	7 50
A. Hewitt	Advertising and 2,675 copies Canadian Year Books	297 50
King's Printer	20,000 pamphlets 'Hint to Settlers'	261 19
	20,000 Rev. Blais pamphlets	582 74
British American, Chicago.	Advertising 1 year	509 60
Canadian " "	" " $490.38 and 210,000 copies, $1,900	2,390 38
A. N. Kellog Newspaper Co., Chicago	Advertising in about 1,500 local newspapers	7,810 16
Western Newspaper Union	" " 2,356 newspapers	13,633 97
Chicago " "	" in 1,479 newspapers	8,304 24
Lord & Thomas	" in about 200 home print papers, $9,831.83; cuts, $47.71	9,879 54
Duluth Evening Herald	"	7 50
Duluth News-Tribune	"	1 50
St. Paul Journal	" $50 and German names, $25.62	72 62
H. P. Hall, Advertising Co., Chicago.	"	531 50
Herald Publishing Co	"	25 00
Aug. Zimmerman & Co.	"	304 45
Pittsburg Newspaper Union	"	256 88
The Post, Rush City, Minn.	"	3 00
Wisconsin State Fair, Programme	"	25 00
Mining Journal Co., Marquette	"	16 00
Mining Gazette, Houghton	"	150 00
Taylor Bros., Salt Lake City	"	336 90
Merritt & Hector, Duluth, Printing.	"	16 25
North Land Printing, Duluth	"	15 25
Swedish-American Publishing Co.	"	9 80
Rand, McNally & Co	220,000 English atlases, $15,775.65; 15,000 German, 10,000 French and 10,000 Swedish atlases, $2,507.05; 20,000 maps, $100; engraving, translating, type-setting, plate, &c., for atlases, $1,993.78, and electros, &c., $114.19, making a total expenditure of $20,490.67; one-half of which is chargeable to United States and one-half to Britain	10,245 34
	Total	70,764 41
British Isles.		
Warwick Bros. & Rutter, Toronto	151,000 pamphlets 'Canada'	11,450 33
	603,400 pamphlets 'Free Land'	7,549 23
Reid Bros. & Co	110,000 copy books	4,400 00
Davidson Bros	Photos, &c	350 00
Rand, McNally & Co	As nearly as can be ascertained one-half of all atlases published were sent to Great Britain for distribution. The total of the purchases was $20,490.67, one-half of which is	10,245 34
Canadian Gazette, London, England.	Advertising	778 66
British Empire Review	Advertising	36 50
McCorquedale & Co., London.	Printing and advertising	1,918 75
Miss M. Drake	Advertising	6 14
Chas. Birchall, Liverpool	" in British newspapers	1,803 22
British Canadian Review, Liverpool.	"	365 01
	Carried forward	

STATEMENT of amount expended for Printing, Advertising, Pamphlets, &c., from Immigration Vote during fiscal year 1901–1902—*Continued.*

Name.	Service.	Amount.
		$ cts.
British Isles.	Brought forward	34,773 58
Sharpe & Co., Glasgow	Advertising in British newspapers	853 23
Swan Sonnenschein & Co	"	13 38
Arundel Advertising Co., London	Printing 6,000,000 copies Western Canada, $7,608 and advertising in 253 British papers	22,696 66
Laughton & Co., London	Advertising in British newspapers	384 27
Southern Printing Co., England	Advertising	31 27
McMillan & Co., England	"	21 90
W. A. May, England	"	19 47
	Total	62,923 35
Continent of Europe		
Der Kanadisch Kolonist, Ottawa	11,000 copies	220 00
Danebrog, Ottawa	22,000 "	401 50
Canada, Winnipeg	10,600 copies, $552 and advertising 11 mos., $183.17	535 17
North Atlantic Trading Co	Advertising	2,433 34
Morgenbladet	"	4 87
Paris Canada, Paris	"	1,000 00
	Total	4,594 88
Iceland.		
Logborg Winnipeg	Advertising 6 months and 49,000 copies	2,087 28
	Total	2,087 28
Special New Ontario.		
The Mortimer Co., Ottawa	50,000 Maps	524 15
M. St. John	50,000 "New Ontario" pamphlets	4,720 37
	Total	5,244 52
Expenditure in Canada.		
Freja Printing and Publishing Co	Advertising, 3 months	72 00
North-west Farmer	Advertising Midsummer Fair No., $100 advertising in and 100 copies Christmas No., $100 and advertising *re* labourers, $16.40	216 40
Regina Standard	Advertising Homestead Regulations, three months	112 32
La Patrie	Advertising Duke of Cornwall and York No., $297.33, and advertising Coronation No., $350	647 35
Labour Day Souvenir No., Ottawa	Advertising Homestead Regulations	25 00
The Argus, Stonewall	Advertising	60 30
Griswold Ledger	" 4 months	88 60
Rundschau Publishing Co	"	198 08
Labour Day Programme, Montreal	"	15 00
Rittinger & Motz, Berlin	" in Canadian Kalendar	30 00
Souris Plaindealer	"	53 50
Stovels Directory	" and copies	98 00
Icelandic Alamanic, Winnipeg	"	25 00
The Globe, Toronto	" and 1,000 copies Christmas No	770 00
Parliamentary Guide	"	50 00
L'Echo de Manitoba	500 copies, $20 and advertising 9 months, $93.75	113 75
John Dougall & Son	Advertising in World Wide	100 00
Cardston Record	"	20 00
Frasers Scottish Annual	"	30 00
Farmer Advocate, London, Ontario	"	186 00
Alberta Plaindealer	" 6 months	36 00
Toronta Star	" in Christmas No	100 00
The Advance, Macleod	"	20 00
Trades and Labour Congress of Canada	" in Souvenir No	100 00
Moosomin Spectator	"	78 40
The Albertan, Calgary	"	65 20
	Carried forward	

APPENDIX No. 2

STATEMENT of amount expended for Printing, Advertising, Pamphlets, &c., from Immigration Vote during fiscal year 1901-1902—*Concluded.*

Name.	Service.	Amount.
		$ cts.
Expenditure in Canada.	Brought forward.....	
Labour Directory, Toronto.....	Advertising.....	15 00
Territorial Live Stock Association....	"	65 00
The Advocate, P. Albert.....	"	35 00
Western Agriculture Arts Association of Manitoba.....	" in prize list.....	20 00
Labor Directory, Montreal.....	"	20 00
Isaac Cowie.....	" in pamphlets.....	25 00
Western Horticultural Society.....	500 Reports.....	10 00
Sundry papers.....	Advertising in 46 local papers in Manitoba and N. W. Territories.....	643 67
	Total.....	4,144 57

SUMMARY.

United States.....	$ 70,764 41
British Isles.....	62,923 35
Continent of Europe.....	4,594 88
Iceland.....	2,087 28
Special New Ontario.....	5,244 52
Expenditure in Canada.....	4,144 57
Total.....	$ 149,759 01

IMMIGRANT ARRIVALS FROM 1891-1902.

Then, I was also asked for a statement of the immigrant arrivals from 1891, I think.

By Mr. Wilson :

Q. Yes, I wanted the arrivals, not only by the seaports, but from other sources ?

A. Where we have returns ?

Q. Well, have you not returns of those that came through from the United States ?

A. Yes.

Q. You know this service was established away back in 1889 ?

A. It might be well for me to explain something about this. Prior to 1892, the immigration work was in the Department of Agriculture. I may say that, in conversation with the gentleman who compiled this statement—the statistician of that branch, who filled that position when the work was in the Department of Agriculture, and whom we took over into our department—he informed me, that the statements were absolutely unreliable, and he said there were, no doubt, duplications all through. To show the extent of this, I will give you an instance. In 1891, the returns were compiled by the Department of Agriculture, and they show a total influx of immigration of 82,165. In 1892, after the transfer, the immigration, which of course only includes the seaport arrivals, according to the statement, totalled 27,898, clearly showing that there must have been some mistake somewhere. I got the report of the Department of Agriculture for that year, 1891, which states the thing very clearly. They state, in this, the arrivals from 1884 to 1891 via the St. Lawrence, that is, at Quebec, Montreal and Suspension Bridge ; via Nova Scotia ; via New Brunswick ; Montreal, via Boston, Portland and New York; via Manitoba and the North-west; entering at ports

other than those above enumerated, and other than those from the old provinces, viz.: Winnipeg via United States, 814; Brandon, 71; Regina, 379; Calgary, 164; Whitewood, 45; Port Arthur, 408; via British Columbia: 8,707 at Vancouver, and 291 at Victoria; from the United States at Coaticook, 553 ; at Ottawa, 178 ; at Toronto, 907 ; at Kingston, 2 ; at London, 378 ; at Prescott, 1,031. That makes 68,633—these are the figures for 1884—and, in addition to these, they add 35,191 as reported, with settlers' goods by custom-houses, showing very clearly that these 35,191 must have been included in some of these other statements. That is very clear. These people to such a large number could not have landed at any other ports than those which are named in the list before this, and the number of which is given as 68,633. In 1891, the figures are given as 45,051, and to this they add 37,114, as reported with settlers' effects at custom-houses, making the total of 82,165 which I have mentioned.

Q. That must have been very stupid.

A. Very stupid, indeed.

By Mr. Clancy :

Q. Was it the same officer who has made these statements all these years ?

A. Yes.

Q. How does he come to have had his eyes closed so long ?

A. I do not know. He told me, to prove these statements were absolutely unreliable, that when we took the census after these ten years, we found that the total increase—in the foreign population, I presume—as represented by these figures, showed 40,000, while the statements showed that the immigration had amounted to 800,000.

By Mr. Wilson :

Q. If that is the same man, we should have him here.

A. It is the same man.

Q. To show how he had his eyes closed.

A. He has been there for twenty-four or twenty-five years.

Q. Do you rely on him solidly now ?

A. He does not make all our figures now.

Q. You would want to supervise him ?

A. We supervise all the figures he gives us. I am satisfied, from the figures he has given to-day, that there is no duplication.

Q. But he is comparatively useless, if you have to get another man to check him.

A. Well, that may be so.

By Mr. Clancy :

Q. He says that the annual influx during those years is how much ?

A. They averaged 80,000 a year, about 85,000.

By Mr. Wilson :

Q. What is his name ?

A. W. F. Boardman. So I am afraid, for any practical purposes, the returns for 1891 will not be reliable, although we can give you the returns outside of what we consider the duplications. They run up as high as 112,000 one year, as reported in the returns. This, I think, was in 1883 or 1884.

Q. You have the return there for us ?

A. Yes.

Q. That is for the seaports ?

A. They did not appear to have compiled any figures other than seaports after 1891.

Q. The first five years you simply give the seaports. I had that before from the department ; I wanted the whole returns.

A. That is all we have.

APPENDIX No. 2

Q. This would not be hard to get out from the reports.

A. That is in the report there.

Q. I wanted more than that.

A. We have never reported any returns back of 1892.

Q. They ought to be somewhere in the dpartment ?

A. Not in our department.

Q. But the departments are all open to give any information we ask for in Parliament, and when we ask for the returns other than at seaports, we ought to be able to get them, because they must be in the department that had this before, and we ought to have them, whether they are worthless or not.

A. Mr. Scott informs me there are none.

Q. I am informed by the first man who went into this business, by Mr. Holmes, a near neighbour of mine in my own town, that they brought over considerable numbers, and it does seem to me that these returns must be to be had somewhere.

A. What year ?

Q. In 1890 and on to 1893-94 ; I think the business first started in 1889.

A. We have not the United States returns for 1893-94.

Q. This business started in 1889, and Mr. Webster was the pioneer, I think, and I guess he went over the Dakotas pretty well on foot. I think these returns ought to be had.

A. I will have another look.

Q. Then, you had better not put this return in at present; let us have the correct one.

A. Very well, sir.

Q. I just want, in addition to those that came in by ocean ports, a statement giving us all the arrivals.

By Mr. Clancy :

Q. Mr. Smart, would you turn to page sixteen in Roman Numerals (XVI.) of your report for 1901-02 ?

A. Yes.

Q. There is a table here headed 'The following table shows the total annual immigration from 1897 to 1902, inclusive, classified according to the various countries from which the same was derived.' Now, we will take the first item, and take the current year, 1902—English and Welsh, 13,095. Do you connect all these persons with your agencies in England and Wales ?

A. No.

Q. You do not pretend to do that ?

A. No.

Q. Does that follow with all the others included in that table, namely : Scotch, 2,853 ; Irish, 1,311 ; Galicians, 6,550 ; Germans, 1,048 ; Hungarians and Austrians are bracketed together ?

A. We separated them in 1902—248 Hungarians and 320 Austrians.

Q. There are 1,048 Hungarians here ; in fact, they are both the same, the numbers are the same for German and Hungarians; then Scandinavians, 2,451, and Doukhobors, none ?

A. Yes, 1,048 Hungarians and 320 Austrians, no Doukhobors ; French and Belgians, 654 ; Russians and Finlanders, 3,759 ; United States, 26,388 ; miscellaneous, 7,902 ; making a total of 67,379.

Q. What is meant by miscellaneous ?

A. Well, they are a large number of small figures, in some cases very small figures of a large number of nationalities, and including almost every nationality in the statement we furnished.

Q. Well, where would they come from ?

A. They would come from Armenia, as suggested here this morning, from Bulgaria, from Roumania, from Italy, perhaps from Greece.

By the Chairman :

Q. And Syria ?

The CHAIRMAN.—We have a few of them.

Mr. WILSON.—You are glad there are few.

The CHAIRMAN.—They are doing well.

By Mr. Clancy :

Q. Are persons coming from countries other than those enumerated ?

A. Yes.

Q. What record have you by which you determine exactly the number of persons coming from countries other than enumerated ?

A. Our records are taken at the seaports : the agents at the seaports report every individual, and they report those that are destined for Canadian ports and those who declare their intention to remain in Canada.

Q. You have no information as to whether the steamship companies are in possession of correct information or not ?

A. Well, they have. The steamship companies, of course, have their manifests, with the names of every person on board; we have all the names, also.

Q. They are simply destined for Canada ?

A. For Canadian points.

Q. You do not know whether they remain or not ?

A. Well, they do not all remain ; for instance, we have found that, during the last few years, a number booked to Winnipeg, Morden and different points, and after they are there, a few cross the line to the United States; but there are practically none, I think, who are destined for Canadian points, or very few at all events, that are not ticketed through. There are a few to Montreal, I think, and a few from other points who go across the line.

Q. In all, there seems to be 67,379 persons reported ?

A. Yes.

Q. As coming into Canada ?

A. Yes.

Q. You do not intend to associate that number of persons with your agents in the respective countries ?

A. No, I cannot possibly do that.

Q. I suppose you cannot tell what proportion of them came in through the instrumentality of your agents ?

A. No, not directly, but I suppose a good many of them could be traced ; but for a large number it would be almost impossible to say.

PER CAPITA COST OF IMMIGRATION.

Q. Now here is the *per capita* cost, making comparisons between 1901 and 1902 ?

A. Yes.

Q. Continental : in 1901 the cost was $2.65, while in 1902 it was $2.44 or something less ?

A. Yes.

Q. And the cost for the British in 1901 was $9.58, while in 1902 it was $7.01; for the United States it was in 1901, $7.96, and in 1902 it was $6.74, and the average *per capita* for the period 1901 was $6.11, while in 1902 it was $5.29 ?

A. Yes.

Q. Now, is that calculation made upon the expenditure divided by 67,379 ?

A. Exactly : the expenditure of each year is divided by the total of arrivals.

Q. Will you tell the Committee how you reconcile that statement with the calculation of the cost per capita to the country, since you are unable to say how many of these come in as a result of the expenditure of that money ?

A. We do not attempt to do that at all. We are simply making a *per capita* statement to show that with the larger number there is a decrease in the cost of each immigrant who arrived in this country.

Q. Yes, but that immigrant did not come here : you tell us that you are not prepared to say how many have come by reason of the efforts of your agents ?

A. No, I do not say that. I say, we cannot trace them : it is almost impossible to trace a large number of immigrants to direct effort on the part of the agent, although there is no question in the mind of the department that it is through our efforts they came, very largely, if not altogether.

Q. Well, was it through your efforts that 6,550 Galicians came here ?

A. Yes, partly.

Q. Was it wholly so ?

A. I won't say that, because a large number of Galicians came in by themselves and others have come because the money was sent back to them by their friends who are in the North-west ; they have come because of the success of their friends who are already here.

Q. You are not prepared to say that they came in wholly from your efforts ?

A. No, I won't say they did.

Q. No, then, there are 7,902 miscellaneous, how many of these came in through the expenditure of money for immigration purposes ?

A. Very few.

Q. Very few ?

A. Yes.

Q. Why do you count them in producing the per capita cost ?

A. We cannot very well leave them out in making any statement, we cannot decide as to whether these people came directly through our efforts or not.

Q. Did you make any effort to get these persons ?

A. Perhaps some of them, yes.

Q. Can you name some of them ?

A. Those who came from northern Italy.

Q. How many came from there ?

A. I cannot tell you the numbers.

By Mr. Schell:

Q. You are acting indirectly there through the steamship agents ?

A. In so far as the continent is concerned we act directly with a syndicate of steamship agents.

Q. Do you furnish the steamship agencies with literature ?

A. Very little ; under the contract they supply their own.

By Mr. Clancy :

Q. Since you are unable, Mr. Smart, to trace, and I think that is a very reasonable statement, you are utterly unable to trace just how far the money expended for immigration purposes has reached, and been the means of a large number of persons coming in, do you think that is a fair statement ?

A. I do not think it is possible to answer that directly. I am perfectly satisfied that the large expenditure we have made the last two years in Great Britain has been the means of bringing a tremendous increase in the number of British immigrants, but I cannot trace every individual's arrival to the efforts of our agents.

By Mr. Ross (Victoria) :

Q. In many cases you can ?

A. Yes.

By Mr. Clancy :

Q. Those from the United States you probably have better means of tracing than those from other countries, have you not ?

A. No, I do not know that we have any better means.

Q. Have you not more perfect machinery there ?

A. Yes, we have the certificates from the agents.

Q. Are you prepared to say that the 26,388 that came from the United States came through any work of your agents ?

A. All of them.

Q. All of them ?

A. All of them, you say ?

Q. Are you prepared to say that all of them came through your agents ?

A. No.

Q. What proportion did come ?

A. A very large proportion.

Q. I am asking you to give facts, and not your opinion.

A. I am not able to answer that directly.

Q. You are not able to give any facts other than what would be an opinion on your part ?

A. The opinion is based upon a pretty good assumption, you know. We know that when we stop advertising, we get nobody, and when we start it and put our agents out at work, we get a pretty large aggregate.

Q. As a matter of fact, are you prepared to say that these 26,000 people came through the efforts of your agents ?

A. Yes, I am prepared to say that considerably over one-half of these people came through the efforts of the department.

Q. Is that statement based upon absolute knowledge or upon your opinion ?

A. I do not know how many certificates we receive, but we can find out the exact number, certainly.

Q. Now, you have told us that more than one-half have come through the efforts of your department, and the Committee is going to assume that you have positive knowledge of that ?

A. You are putting it a little too fine.

Q. No, that is not fine at all. I think the Committee is entitled to assume that, Mr. Smart, if you will adhere to that statement.

By Mr. McLennan :

Q. In the case where one-half the number can be traced to the agency of the department, and where it is understood that these people who have come into this country have sent money back to their friends to induce them to come into this country, cannot that be very fairly traced, I think, indirectly traced, to the departmental work ? For instance, a certain number come to this country through the agency of the department ; these in turn send money to their friends, so that a great number come in turn. I, in my judgment, feel that these can be traced very directly to the agency of the department ?

A. I can say this, with regard to this question, that during the months of the year when the department withdraws its advertisements, the correspondence by way of inquiry as to the country, the conditions of railway transportation, and so forth, practically falls to nothing. But as soon as we advertise again, the correspondence reaches, with the agencies, perhaps as high as 1,000 letters a day. Whether you consider that is any evidence to show that a large part of the work, at all events, can be directly traceable to the work of the department or not, I leave to the Committee to decide. I believe it does.

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By Mr. Ross (Victoria) :

Q. I think it is impossible, Mr. Chairman, to state definitely the number that come in through the agents, and the number who come themselves. I think it would be almost an impossibility, perhaps. You might as well ask a clergyman if it was by the influence of his preaching that all these people come to church.

By Mr. Stephens :

Q. A business man advertises his business, but he never knows, he never did know, and never will know, exactly what effect that advertisement had on the increase of his business. If his business increases, he naturally thinks it is because he advertises ; and I have no doubt that will be the case with regard to immigration.

By Mr. Heyd :

Q. What will happen, if he ceases to advertise his business ?

By Mr. Clancy :

Q. We have Mr. Smart here, giving his evidence. I hope that good taste would suggest that I would not put an unfair question, and I do not think it is necessary for several gentlemen to offer apologies.

The CHAIRMAN.—It seems to me that Mr. Smart has, to all intents and purposes given an answer that ought to satisfy any reasonable person, so far as it appears to my mind. There should be a limit to your questions. The question may be fair enough to elicit a certain amount of information, but you may press that question unreasonably or too far. It is perfectly evident that the department cannot in every case show that this man, or that man, or the other man, comes as a result of their advertising ; yet they have a strong conviction that the great bulk of these people come as a result of their effort, through their agents, in bringing information about the country under the notice of the public. I think we might drop that question.

Mr. CLANCY.—With all due deference, I do not think you have the right to say to this Committee just what questions we are to put, and how far we are to press them. I submit that the Chairman, the presiding officer, is not to be the judge of the propriety or impropriety of the question, unless it is one that is out of order. I am going to ask this question, and if you think proper to stop it, and if the Committee upholds your position in that, I shall submit, as I have to submit under the circumstances.

By Mr. Richardson :

Q. Have you any means of knowing definitely and certainly what proportion of immigrants coming to the country come as a result of your agencies and advertising ?

A. No, except we have in some of the United States our own local agents, and we have the certificates that they issue, upon which we pay the bonus, but that applies to a very small proportion, after all.

By Mr. Clancy :

Q. This table, Mr. Smart, goes to the country as the departmental report, does it not ?

A. Yes.

Q. If a calculation of this kind is made, reading thus :

'The approximate expenditure during the past fiscal year chargeable against immigration from the countries above mentioned, not including the expenses connected with the reception and location of immigrants, was as follows : —

'Continent of Europe, $58,000.

'Great Britain and Ireland, $121,000.'

This giving, as I have said, the per capita cost for the respective years means in that report, if it has any meaning to the public who read it, that this money was spent

on the total number of persons coming from the respective countries, and thereby carrying with it, reasonably, to the public mind, that all these persons came in as a result of that expenditure, if it were to be justified. Is that the case, or is it not, now ?

A. I do not know that we can look upon it in that way at all. We have a certain expenditure every year for immigration ; we advertise thoroughly in the countries from which the immigration comes, and in those countries from which a very small number come, there is really no advertising. I do not see that it is an unfair statement to make, or an unfair calculation to make, to assume that the expenditure made in those countries was the means, indirectly, if not directly, the means of bringing Canada to the attention of these people, and that they came here through that expenditure. I do not think, even taking another view, that in making the calculation it is unfair to take the total cost in Europe, for instance, and divide it by the number of people that came from that country, and say that is the average cost per capita to the people of this country for those immigrants. I do not know how otherwise you would make any per capita statement at all.

Q. I shall refrain from any argument on my part about that. You assume, when you make the calculation, if it has any meaning, that they all came in ; I mean that is the assumption—they all came as the result of the expenditure of this money. If you use them in that calculation, that is the assumption, that they came as a result of it ; is that it ?

A. Directly, and indirectly, I would think so.

Q. Now, having stated that, is the assumption a correct one, as a matter of knowledge ?

A. I cannot answer that question.

Q. You cannot answer that ? I have no more questions to ask, Mr. Smart.

By Mr. Roche (Marquette) :

Q. Mr. Smart, in estimating the per capita cost you included all the arrivals, I understand. Now with respect to the Barr colonists, you do not attribute their coming to the efforts of the government agent ?

A. Yes, we do. I think that nine-tenths of the people in the Barr colony would have come here if they had never heard of Mr. Barr.

Q. Then he has had a snap ?

A. No, he has simply taken the commission from the steamship companies, that if he had not got it, some other agent would. He has had nothing from the government.

By Mr. Guthrie :

Q. A large proportion of that expenditure is for advertising ?

A. Yes.

Q. And if the return does not come this year it will come the year after or some time hence. It is absolutely impossible to say what the result of a certain expenditure was.

A. Certainly not.

STEAMSHIP BOOKING AGENTS AND FEES,—COMBINATION OF S.S. LINES.

By Mr. Stephens :

Q. Who pays the fees of these booking agents, the government or who ?

A. No, the steamship people.

By Mr. Wilson :

Q. That depends a little, I think you used to.

A. We pay the ordinary booking agents in addition to the steamship for British immigrants.

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Q. To all of them ?

A. Yes.

Q. That has occurred since Mr. Preston got into trouble over it ?

A. No, that has always been the case.

Q. I remember distinctly Mr. Preston took a particular line, employing booking agents of one or two lines and there was a general row raised by the rest of the steamship companies. You must have noticed that in this report.

A. I have not. I did not think there was anything of that kind; every agent got a commission upon every person of a certain class that he sent to Canada, but we did not pay for any other. I probably can explain to assist Mr. Wilson in the point, and it is this, that the booking agents in Great Britain are all the agents of what they call the conference lines. For a number of years the Elder-Dempster Company was not in the conference, and consequently the other steamship lines would not allow these booking agents to act for the Elder-Dempster Company. It is a fact that we have in some cases paid to the Elder-Dempster Company's agent directly for booking agents, that was particularly the case in respect to Icelandic immigration.

Q. There is quite a lot here in Mr. Preston's report in connection with the trouble. I think it is the Elder-Dempster line, that he particularly favoured, was it not ?

A. I do not know whether he favoured them or not. We don't favour any particular line, unless we can get some special advantages by doing so.

Q. Well, you have Mr. Preston's report there, you can read it.

A. Do you want me to read all this discussion ?

Q. Yes, you might read it for the information of the committee.

A. Do you want me to read the whole of this, Mr. Wilson ?

Q. You might read it, so that the Committee will understand.

A. Very well, Mr. Wilson :

'It might be explained here that for several years a conference or combination has existed in connection with the North Atlantic emigration traffic, between all the great steamship lines, with a single exception of the Elder-Dempster or Beaver line. The "conference" was undoubtedly established with a view to "protecting the interests of the steamship companies and affixing the minimum rate which could be charged by the companies for transatlantic transportation." These rates were maintained by the "conference lines" under severe penalties for the infraction or violation of the terms of their agreement.

'The Elder-Dempster line, however, had remained out of the "conference" and was at liberty, and probably sometimes took advantage of its liberty to quote a lower steerage rate, under certain circumstances, than the "conference lines" were willing to compete against. The "conference lines," comprising, as thy do, all the great steamship companies with one exception, have in the aggregate some thousands of booking agents, stationed in every important centre or locality throughout the United Kingdom. These booking agents sometimes represent two or three or more of the steamship companies, and they are debarred by the regulations of the steamship conference line not in the "conference." The effect was, that the Elder-Dempster Company were able to have but a limited number of agents throughout Great Britain, as compared with the vast number of those who worked under the regulations of the "conference." From this it will be seen that, under the circumstances and in view of the expense that had to be incurred by advertising their own line and standing practically alone in competition with the "conference lines," the Elder-Dempster Company was under a serious disadvantage ; but with the possession of the names on the list of offices directly with the prospective emigrants, and on that account a much more serious competitor than they had been enabled heretofore to be. This naturally disturbed the "conference lines," and they proceeded to take certain steps which they regarded as necessary to protect their interests, in the hope of being able to avoid this competition on the part of the Elder-Dempster Company.

'It was represented that, in the interest of all concerned, and in view of the desirability of the steamship companies and their booking agents continuing to work in harmony with the department, it was necessary that the aggressive policy which had been adopted by this office in the carrying on of its propaganda should be changed. It was, therefore, suggested :

'(1.) That no more specially conducted parties should be sent ;

'(2.) That the addresses of steamship companies should not be given in the government advertisements ;

'(3.) That lists of inquirers or applicants for information at the government offices should not be sent to the steamship companies ;

(4.) That the shipping or sailing notices of the steamship companies should not be sent out with the departmental literature ;

'(5.) That the appointment of sub-agents from among the booking agents should be discontinued ;

'(6.) That the appointments already made should be cancelled immediately, and, practically, that the carrying on of an emigration propaganda should be left with the booking agents of the country.

'In order to more thoroughly understand the situation of the booking agents in respect to the steamship conference or combine, it ought to be explained that, in licensing booking agents, several conditions are attached to the form of appointment. One is, that no advertisement shall appear with the consent or responsibility of the booking agent in question which has not previously been submitted to and approved of by the secretary of the "conference." So that, when booking agents advertise themselves as having been specially appointed by the department of the Canadian government to give information in their respective localities, technically they were violating one of the conditions under which they were licensed to do business. This particular restriction is, I understand, placed upon the booking agents with the intention of preventing an appearance of undue competition between the representatives of the respective lines, as it is one of the conditions of the steamship conference, that one line shall not specially advertise itself as furnishing better facilities and better accommodation than the others. In connection, therefore, with the appointment of booking agents as sub-agents of the department, and advertising them as such, it immediately gave the favoured ones a status in public estimation in their several localities which the avoidance of competition on the part of the steamship companies rendered undesirable from their standpoint. This attitude of the conference, of course, presented for consideration whether the policy specially favoured by the department should be carried out, and had to be weighed in all its phases. The conclusion was reached that, in the carrying out of the aggressive policy already indicated, greater advantages were to be derived by the department than any disadvantages which could possibly accrue from a rupture with the steamship conference agents. The secretary of the "conference" was not slow, at a certain stage of the correspondence between the department and the representatives of the steamships interested, in taking the first steps with a view to the cancellation of the licenses or the withdrawal of the agencies of the steamship companies from the sub-agents of the department.

'It is needless to point out the undesirability of entering upon what might be termed a serious conflict between the department and the great army of steamship conference booking agents throughout Great Britain ; and yet the department of a government could not afford to accept the suggestion or dictum of any steamship combine as to its general policy, when the acceptance of the "suggestion" in question simply meant cessation of an active propaganda by the government of Canada among the emigrating classes of the United Kingdom.

'No one having any acquaintance with the emigration work in Great Britain can fail to see the serious aspects of the situation thus presented for the consideration of the department (no matter what form this fear of a misunderstanding might assume). The advantages of working in harmony with the booking agents throughout the King-

dom are self-evident, and yet the acceptance of the "suggestion" from the steamship companies revealed the possibility of a Canadian emigration propaganda being relegated to a question of less than secondary importance by the booking agents. The prospect of possibly finding the department in conflict with the representatives of the North Atlantic steamship conference throughout Great Britain was not one that could be regarded with indifference. Nevertheless, it was apparent that neither from the fear of such a contingency nor the probable immediate disadvantages arising from such circumstances could a department representing the Dominion of Canada afford to accept such suggestions, or have its public policy dictated by any company or combination of capitalists or corporations, no matter how great or vast might be their influence.'

The WITNESS.—I may say, in connection with the matter of the objections raised by the steamship people who are in the conference, that Mr. Preston was acting entirely upon the advice of the department as to whether we should have the right to name special agents for certain localities or not.

Mr. WILSON.—That removes the responsibility from him.

THE BARR COLONY.

There was another matter I brought up at the beginning of this meeting, with reference to the 1,900 who, you said, had homesteaded, of the Barr colony. You said that 1,900 had homesteaded.

A. That is a mistake. I said there were 1,900 people who came over with Barr. As a matter of fact, there are homestead fees paid for 2,100 homesteaders.

Q. What I wanted to get at was simply the number of people that came with the Barr colony.

A. It is quite correct to say that about 1,900 people came on the ship with Barr.

Q. Is that the whole number of the people that came ?

A. Yes.

IMMIGRATION AGENTS IN THE UNITED STATES,—NAMES AND SALARIES.

By Mr. McLennan :

Q. It seems to be conceded by all that the immigration from the United States is possibly the most important we get and the most acceptable, for the reason that the people who come from across the line are people who originally hailed from the older provinces of Canada—Ontario, Quebec, and the maritimes provinces. Is it not understood that the agents who are engaged in the work of sending so many of these people back to their native Canada, or that at least a fair proportion of these immigration agents hail from the various older provinces, and would Mr. Smart be kind enough to give the Committee the number hailing from the various provinces ?

A. The agents ?

Q. Yes, operating in the United States.

By Mr. Wilson :

Q. Before Mr. Smart starts on that, I would suggest that he should give the number of agents on salary in Great Britain, Ireland, the Continent and the United States, and the number of men in all these places, because I understand that in Europe and Great Britain and Ireland and the Continent they have changed the system within a year and a half and there are very few agents on salary.

A. We have only one agent on the Continent altogether.

Q. Besides, you might give the fees paid and the number sent by agents on commission.

A. I intended to bring up the question of the work of the agents in the United States and in Europe separately. It seems to me to be more satisfactory to follow up

the work in that way than to join them together, because it is very difficult to follow the statement I have to present to the Committee.

Mr. McLennan.—That is the reason I asked my question. I give as my reason, particulary in this direction, that vast developments are taking place in the last number of years in the Island of Cape Breton. For instance, to-day there are between 25,000 and 30,000 foreigners, who have come within the past four or five years into that island. I suppose of these, 25,000 have come to Cape Breton from abroad. In looking over a list of employees in the office of Messrs. Mackenzie & Mann, operating an important coal mine in Inverness, I notice that among several hundred workmen, two-thirds of the names are foreign names. Now, if any clever agent in the province of Nova Scotia, particularly from Cape Breton, would go to Boston or to any of the New England States, or through the Massachusetts towns, he could in one season, I think, readily repatriate between 10,000 and 20,000 people hailing originally from the Island of Cape Breton.

By Mr. Wilson :

Q. You have not made any explanations about the United States yet, have you ?
A. No.

By Mr. Smith (Wentworth) :

Q. Of the immigration from the United States, how many are of Canadian origin?
A. It is impossible to tell that.

The Chairman.—If the Committee would allow Mr. Smart to take up one of these countries and exhaust the subject, and ask him any questions upon it that they chose, it might expedite the work.

The Witness.—There was a question which Mr. Wilson asked me before I read that extract. I do not know what the question was. You gave me the book to read. I do not think the extract I read really bore on the question you asked, and I think the question was an important one. Then a question was asked as to the staff we have in the United States, and where they came from originally.

We have a staff of one inspector, W. J. White, who is in general charge of all work in the United States. He has charge of all advertising and all publications we get out in Canada.

By Mr. Wilson :

Q. Are his headquarters in Ottawa ?
A. His headquarters are in Ottawa. About three-quarters of his time is occupied in the States, overlooking the work of the agents, and assisting wherever it is possible to do it.

We have, besides Mr. White, 21 agents at 21 different points, and we have 280 sub-agents who work on commission. The 21 agents are all paid by salary, and I will read their names :

M. V. McInnes, who came originally from London, Ont., and who is now in Detroit. His salary is $1,800.

Q. What do you pay with reference to expenses for these men ?
A. They get their actual travelling expenses. Mr. McInnes gets his actual travelling expenses while he is away from his headquarters in Detroit.
Q. He is away a good deal, then ?
A. We expect that, especially during the busy season, they will be travelling over the country all the time. In his office we have an assistant who is in a position to answer all correspondence.
Q. He seems to receive board and lodging, $528.75, and fare, $761.28.

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A. Mr. C. A. Laurier, Marquette, in Michigan, receives $1,200. I think he is from Quebec.

Q. There is another thing, before you go on with that very far. Last year or the year before, we had a statement of the number of days these people travelled or spent in their offices. Could you give us that ?

A. I could give a statement of that.

E. T. Holmes, of St. Paul. He was formerly from some part of Ontario, and receives $1,500.

C. O. Swanson. He is a Swede, and is working particularly amongst the Swedish population in Minnesota. He has formed a number of very successful colonies of Swedes in Alberta, and has, in fact, done excellent work for the country. He receives $1,500 per annum.

Then, there is T. O. Currie, of Milwaukee, formerly of Ontario, who receives $1,200.

J. M. McLachlan, of Wausau, Wis. He receives $1,200. He was formerly from Manitoba.

James Grieve, Sault Ste. Marie, originally from Stratford, I think, or the county of Perth, $1,500.

J. S. Crawford, of Kansas City, receives $1,200. His former home was at Virden, Manitoba.

W. H. Rogers, Watertown, S.D., receives $1,200.

W. V. Bennett, of Omaha, receives a salary of $1,200. I cannot say what portion of Canada he is from, but he has lived in the United States a very long time. He is one of the most active agents we have, and was formerly connected with the railway in Omaha. He was picked out as a man well qualified for the work, and has done good work.

J. C. Duncan, Indianapolis, Indiana, receives $1,200. He came originally from the province of Quebec, from the Eastern townships.

H. M. Williams, Toledo, Ohio, receives $1,200 per annum. He came from Picton, or the county of Prince Edward at all events.

C. J. Broughton, Chicago. He came from Hamilton, and receives $900.

Benjamin Davies, Great Falls, Montana, receives $1,200 per annum.

Q. Not $1,500 ?

A. No, it was reduced some time last year. I think he had $1,500 previously.

Q. Are there several others reduced ?

A. I cannot tell you.

Charles Pilling, Grand Forks, N.D., receives $1,200. He was formerly a resident of Manitoba.

Damase Gauthier, Laurentides, is from Quebec, and he receives $1,000. His work is principally in connection with the Temiscaming district. We have two agents there, Mr. Gauthier and Mr. Ribout. Mr. Gauthier receives $1,000, and Mr. Ribout, $1,200. They work in the Temiscaming district—in the district north of the Ottawa river.

R. A. Burriss, Port Arthur. His work is altogether in New Ontario. His headquarters are at Port Arthur, where he receives Americans arriving from the United States who are going to New Ontario.

Q. Was he a clergyman ?

A. Formerly of Bowmanville, I think.

Q. Of what denomination ?

A. I think he is a Disciple. He receives $1,200.

Then, there is Rev. Father Blais, repatriation agent, Montreal. He works in the Eastern States, and sometimes goes to the French settlements in Minnesota and, I think, some of the other States of the West. He receives $600 per annum.

Rev. Father H. L. Vachon is another repatriation agent. Both of these priests belonged to Manitoba before they took up this work. That is the total list of the agents we have working in the United States.

Q. That is under salary ?

A. Yes. In addition to that, we have the 280 sub-agents, who are paid a commission of $3 per head for each man who is over eighteen, and for each woman of the same age, $2, and $1 for all others. The certificates for which are returned to us by the Canadian Pacific Railway as having purchased tickets at the boundary for places in the west.

By Mr. Boyd :

Q. Have you a list of the immigrants these people sent, and the bonus they received ?

A. Yes, I have their certificates.

Q. You have given the names of the agents, the places they came from, and the salaries they receive. Now, if you will give the Committee a record of the work they have done, it will be a good thing.

A. At present we are tabulating that statement, so that it can be referred to at any time without any difficulty. Formerly we did not think it was worth while doing that.

Q. That information is all very well, but the result of what they have done would be more useful.

A. We can see that by——

Q. We do not care about the names or where they came from, what we would like to know is what they have done.

By Mr. Wilson :

Q. What you have got for your money ?

A. The agents——

By Mr. Boyd :

Q. That is what I am getting at. If they are not doing anything where they are, send them somewhere else.

A. That is what we are doing.

Q. We do not care what their names are.

A. I think the statement I read to the Committee as to the arrival of 32,000 American immigrants last year ought to be some——

Q. Now we are getting down to details. You have been giving simply names and expenses, and you have not given us any useful information to show what these men have done particularly. If you get down to numbers, you will be able to show us what the results are.

A. It would be very easy to tell what they did.

Mr. McLennan.—It is a most important answer and question also, because it shows that a considerable amount of public money has been spent to repatriate people who originally left the province of Quebec and the province of Ontario for the United States, that these people are sent there to repatriate them. That is a first-rate piece of work, and a most commendable piece of work ; but what I wish to point out is, that the maritime provinces have no such agents in the United States for the repatriation of a great many of their population that have gone to the United States when times were not so brisk in the maritime provinces as they are to-day, when very great developments are being carried on there, and the maritime provinces would be anxious to have the government of Canada show the same desire to repatriate their lost population with the same vigour that they are showing in Quebec and in Ontario.

Mr. Ross (Ontario).—I do not think the object of the agent is to confine his efforts to these people at all. The agents endeavour to get every person that would be looked upon as a proper resident of this country to come to this country, whether they formerly belonged to Canada or not.

Mr. McLennan.—There is no getting over the idea, though, that all these provinces would prefer to see their original sons and daughters coming back to them.

By Mr. Sproule :

Q. Would you give us what commission these agents get ? I would like to know how much is given by the government in any way to the railway companies or to individuals, to each member of the family that comes over ?

A. I have just stated that the sub-agents, who are appointed by the agents themselves in the various towns, are paid $3 for every man eighteen years and over, $2 for every woman of the same age, and $1 for all others. These are the local agents who receive commissions. Of course, our agents receive no commission ; they get a salary.

RAILWAY RATES TO IMMIGRANTS.

Q. Is there any allowance made by the government to the railway companies on account of the reduction of fare for each member of the family ?

A. By the government ?

Q. Yes.

A. No.

Q. Nothing is paid to the railway companies for the reduction ?

A. Nothing.

By Mr. Hughes (Victoria) :

Q. You have special arrangements with the railway companies for special rates ?

A. Yes.

By Mr. Sproule :

Q. There has been a special arrangement ?

A. There has been for the last few years, but I am afraid it will be over, on account of the new Bill.

Q. I understood, from a statement in this Committee a few days ago, that there was no such arrangement.

A. We had such arrangement.

Q. I want to know whether they were discontinued or not ?

A. In Canada or in the United States ?

Q. Both.

A. We have some arrangements in the United States, and I cannot give the figures; and we have to-day, even in Canada, special rates, by which an immigrant from the United States can receive a ticket at the boundary on the Canadian Northern or the Canadian Pacific Railway at a cent and a half or a cent a mile. The Canadian Northern charge a cent and a half, and the Canadian Pacific a cent to any person producing the certificate which our agents give to all incoming immigrants. That is for all immigrants going west, of course, whether they take the Canadian Pacific Railway line at eastern points or at western points.

By Mr. Hughes (Victoria) :

Q. Is anything done in reference to giving people from the maritime provinces or the older parts of Canada special encouragement to go to the west. For instance, a young fellow from Calais, in Maine, wants to go to the west, and he gets special privileges. A young fellow from St. Stephen, just across the line, in New Brunswick, wants to go, and he cannot get such special privileges.

A. That is correct.

Q. Can you give the explanation ?

A. In the first place, the Canadian Pacific Railway refuse to give any special rates for the transfer of people from one part of Canada to the other. They say, if

they do that, it will demoralize all their transportation ; but people coming from the United States to become settlers they consider will be an advantage to the company, if they locate along their lines, and, consequently, they give special rates, which they refuse to give to our own people.

Q. What is the difference, what is the preference ?

A. Perhaps it would amount to $10 or thereabouts. For instance, here is an immigrant who pays from Montreal to Winnipeg about $15. I think the ordinary ticket would amount to about $25, from $22 to $25.

Q. That is $10 difference ?

A. Ten dollars of a difference.

Q. I understand that maritime province men obtain an advantage over the rest of the east by going to Boston and then coming in as immigrants from the United States ?

A. That is suggested. I do not think there are many cases.

Q. The point I make is : Why do not our people in the east who want to go west get the same privileges as immigrants ?

A. I understand, the C.P.R., as I say, object to giving immigrant rates from point to point in Canada.

By Mr. McEwen :

Q. There should be some way by which immigrants from Ontario should get up there at cheap rates.

By Mr. Sproule :

Q. Well now, Mr. Smart, we will take a family of eight coming in from the United States. How much would be paid out for that family ?

A. Five dollars for the father and mother.

Q. Five dollars, and then there are six children ?

A. That is $11.

Q. Well now, under eighteen ; there are six under eighteen.

A. It would amount to about $10 a family ; it is generally estimated at $10 a family.

Q. The father and mother would be $5, and six children would be $6 more ?

A. Yes.

Q. What reduction is there in the railway fare ?

A. They get the advantage of a cent a mile in Canada, as well as the reduction, whatever it is, in the States.

Q. I ask what the reduction would cost us ?

By Mr. Wilson :

Q. It would cost us nothing ; we pay nothing.

A. We pay nothing ; that is right.

By Mr. Sproule :

Q. But you do pay something here on fare, besides bonus ?

A. No.

Q. I understand from your report we do.

A. The department did, many years ago. They had a system of a reduction of a dollar on homestead entries, taken off by the production of this certificate ; that is the only bonus.

By Mr. Hughes (Victoria) :

Q. Tell me, Mr. Smart, this $10 to the father and mother and five children goes to the agent, and not the family ?

A. To the sub-agent.

APPENDIX No. 2

By Mr. McGowan :

Q. The family do not get it ?

A. No. I think the bulk of our certificates are issued by our own agents, who are paid by salaries; but we have some agents who made a great amount of money in this way. We had one agent in the Dakotas who made so much that we had to dispense with him.

By Mr. Wilson :

Q. For what reason ?

A. For the reason that he was making too much, and we put a salaried agent in his place. He was making $4,000 a year as a sub-agent, and was practically at liberty to do any other business.

By Mr. Boyd :

Q. He got the goods ?

A. He got the people.

By Mr. Wilson :

Q. I do not see why you let an agent like that go ?

A. We thought we could do as much with our own salaried agent.

By Mr. Sproule :

Q. What is there to prevent him getting the names of people who are going to go to Canada and getting them to put their names down as immigrants ? I am told that is the case.

A. It might be done.

By Mr. Hughes (Victoria) :

Q. What Mr. Sproule means is, that these sub-agents would find people going across the line, and issue them certificates as immigrants, and so get the bonus.

A. They might do that.

Q. I know of hundreds of cases of this having been done.

A. That is so, but there is no way of overcoming that.

By Mr. Sproule :

Q. You gave the names of the sub-agents ; have you any inspector over them ?

A. One inspector.

Q. What is his name ?

A. Mr. White.

Q. I thought he was here, at Ottawa.

A. His headquarters are here, but, as I said, he travels three-quarters of the time.

Q. What capacity is Mr. Speers in ?

A. Mr. Speers is altogether in our own country. Occasionally he goes through portions of the United States to do special work, but only for a short time.

Q. He is on salary ?

A. Yes.

Q. I thought he was an inspector.

A. No, he is colonization agent ; he visits all the colonies in the North-west and reports upon them.

Q. What is his salary ?

A. Two thousand dollars a year.

Q. And expenses ?

A. And travelling expenses, actual travelling expenses.

Q. Does he give his full time to the duties of his office ?
A. He gives his full time.

By Mr. Johnston (Cardwell) :

Q. I understand, you have dismissed this sub-agent in Dakota ?
A. Yes.
Q. Did this $4,000 a year man deliver the goods ?
A. We got the certificates and paid the money.
Q. He got no more for each immigrant than every other sub-agent ?
A. He got such a large amount because he had a territory much better to work in than others had, and he did nothing else practically; he gave his whole time to the work ; but he was along the border of Dakota, where there was a large movement.
Q. As I understand, this sub-agent captured a good many who were going into the west anyway, and all he had to do was, stay at the station and give them certificates.
A. No, he has travelled a lot.
Q. He was a good agent ?
A. He was a good agent ; yes, he was.
Q. I do not understand why he was discharged.
A. Because we deemed it advisable, in the interests of economy, to put a man of our own at a salary there.
Q. If there were people going to emigrate, you counted them as ones sent by these agents afterwards ?
A. It may be true.

By Mr. Smith (Wentworth) :

Q. How many does the man send who is on salary there now, can you tell ?
A. No; it is only a few months since the change was made.
Q. What proportion of those from the States came on certificates ?
A. Of course, the bulk of them did, because they got the reduced rate in that way.
Q. You have the certificates ?
A. Yes.

By Mr. Hughes (Victoria) :

Q. I do not know whether it is germane to the subject, but there is a class called Nestorians coming in, and I hear they are located on land in our North-west ; is that correct ?
A. There was a party of thirty-one or thirty-two Nestorians brought out by English friends from Syria and placed in charge of a man named Adams, who lived in New York for a number of years and who had lived in Persia ; that is last autumn, and they settled on lands in the North-west.
Q. There is no large reservation for them ?
A. No.
Q. No eight or ten townships set apart for them ?
A. No.
Q. That is all right.

By Mr. Wilson :

Q. You were to bring us some newspapers showing the advertisements you publish.
A. Yes, I have them here.

By Mr. Sproule :

Q. You gave the number of sub-agents working on commission ?
A. Two hundred and eighty. Of course, the average amount they receive is much less than $4,000 ; they average about $200 each.

APPENDIX No. 2

By Mr. Wilson :

Q. Are these the newspapers ?

A. Yes.

Q. Will you leave these papers with us ? I do not want them to go into the evidence, but I would like to look at them. You do not mind ?

A. No, I will leave them with you.

Q. Have you any knowledge of any immigrants going into the United States that have been turned back, that is, from Canada ? I mean European immigrants.

A. Yes.

Q. Are there many of them ?

A. There were about 1,200. Since the American government established offices for the examination of immigrants and the granting of certificates to them to enter into the United States, in Manitoba, which was on January 5 or February 5, I think. There were about 1,200 immigrants who were booked through, I think.

Q. That is, Canadian immigrants ?

A. Yes, who applied for certificates to permit them to cross the boundary into the United States. These were all granted certificates on examination, excepting 377 ; about one-third, I think, of the number were refused.

By Mr. Hughes (Victoria) :

Q. Was that examination by Canadian officers ?

A. No, by the American officers.

By Mr. Wilson :

Q. On what ground were they refused ?

A. I am endeavouring to ascertain all the facts, and will give the figures to the Committee in a few days. That covers the period since February 1 up to date.

By Mr. Hughes (Victoria) :

Q. Would there be any system of smuggling these people over ?

A. Some of them have gone over.

By Mr. Wilson :

Q. I see the Minneapolis *Journal* here says that 1,100 immigrants in May presented themselves for certificates, and only 33 per cent got certificates.

A. They have the wrong end of it. I have a statement from the Commissioner of Immigration that is different.

Q. Even if it is the other way, it leaves a large percentage of rejected.

A. I have asked the reason of their refusal, whether it is on account of disease or anything of that kind, because, if it is, we have to bring our own medical officers at the seaports to book for allowing them to pass through. I have written to the agent at Halifax, and Quebec as well, setting out the facts and asking for information. We have agents at Quebec and St. John.

Q. And you have one in Montreal?

A. We are going to have one in Montreal.

By Mr. Ross (Victoria) :

Q. I have heard that in Halifax the examination is very strict.

A. Halifax is the place where this difficulty occurred, if there is any difficulty.

By Mr. Wilson :

Q. The Minneapolis *Journal* of the 22nd says that that number was prevented coming in, in the month of March.

A. They mean the whole thing.

Q. That is what they say.

A. I saw that in the other papers, too, but it is not correct.

By Mr. McGowan :

Q. Where are these immigrants that were refused now ?

A. They are in Winnipeg, or scattered throughout the country ; they were not all refused on account of disease.

By Mr. Wilson :

Q. Or paupers without visible means of support ?

A. They have some test with regard to a money standard that we have not.

By Mr. Robinson (Elgin) :

Q. Have the Americans any agents in Winnipeg trying to induce our people to go there ?

A. They used to have, but I do not know whether they have any now or not ; two or three years ago, they had men there.

By Mr. Wilson :

Q. Were these agents for the government, or agents of companies who wanted to induce people to go over there and buy their lands ?

A. They were companies. The government has no agents.

Q. That is what I gather, but they are spending about as much money in Canada to prevent undesirable immigrants going into the United States as we spend to bring them in.

A. Yes.

Q. I see that there have been nineteen Russians detained and sent back to Canada.

A. Those are some of the people who have crossed over themselves without certificates, and they reached, I think, as far as Grand Forks. They were driven across, and they were taken in hand by some of the American officials, and I believe they are being returned.

Q. Yes, I see they are going to try this gentleman who took them over, and he has had to give bail for $10,000 for his appearance. It simply shows that we are not perhaps sharp enough with reference to the kind of immigrants that we take into this country. I am glad to know that the government is doing fairly well now, and I think we should have another doctor at Montreal.

A. We are arranging for that now.

Q. I think we should not be so anxious with respect to numbers, but try and get quality as well.

Mr. HUGHES (Victoria).—Another point that is not material to the department and cannot be stopped, perhaps, is that a number of English immigrants came out here a few weeks ago, and all along the trains, and around the streets of Winnipeg, there were gentlemen—I presume they were farmers—who were endeavouring to induce these people not to take up homesteads, but to go and live and work for a year or two and learn farming.

MR. MCGOWAN.—That was a good idea.

Mr. HUGHES (Victoria).—I do not think so at all. I have had experience of people who have learned farming with farmers, and it would be better to put these people on homesteads at once. They had £20, £30, or some of them £100, nearly, and efforts were being made to show them that it would be better for them not to go on homesteads. I do not suppose the department could deal with this matter, but I wanted to draw attention to it. The point I wanted to make is this, that it will be well for the department to see that these people have the proper side and the advantage of homesteading properly placed before them.

The WITNESS.—I think most of them, when they come out, know what it means to homestead land, but a great many of the English immigrants especially have no experience of our methods, and it is generally admitted that if they can get a good place with a practical farmer, it is a good deal better, for the young men especially, to go for a year or two on a farm, and learn the methods of farming on this side, with a view to taking up land themselves. I may say that as far as the department is concerned, it has encouraged that.

By Mr. Wilson :

Q. That is all right, provided they do not get into the hands of a shark. You were to give us a return of the number of American companies who have land there, who have bought land in Canada and are settling it with immigrants from the United States.

A. I will get you all the information that I can.

Q. Have you finished with the United States ?

A. No, I have not.

HOUSE OF COMMONS,
COMMITTEE ROOM 34,
WEDNESDAY, June 3, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock a.m., Mr. DOUGLAS, Chairman, presiding.

Mr. JAMES A. SMART, Deputy Minister of the Interior, was again in attendance by the request of the Committee, and was examined as follows :—. .

SALARIED AND COMMISSION AGENTS.

By Mr. Wilson :

Q. I will have a motion to make, but it will depend upon whether Mr. Smart can give the information I want, or not, whether I make it. Before Mr. Smart goes on with his statement, I wish he would tell me the name of the agent to whom he paid $4,000, and the district in which he operated ?

A. It was William Ritchie, of Grafton, North Dakota.

Q. I guess he got the commission upon the whole outfit, did he not ? Do you know whether it is the intention of the government to continue this commission business ?

A. We have reduced it, and have been reducing it from time to time, as far as the local agents are concerned; we have now about 280, and we had about 500 to begin with. We are reducing it from time to time, as we think we can do without them.

Q. Do you not find, as a rule, that they get commission upon about everybody that comes in ?

A. No, I do not think so.

Q. About your agents that are paid salaries, did you give us any account of how many they bring in ?

A. It is almost impossible to fasten down a certain immigrant as coming through a certain agent.

Q. But you have to do that in the case of commission agents ?

A. We have to do that with the commission ; we can do it very largely from the United States, but a great many come in that we cannot always trace.

Q. I find a difficulty in this Committee that we never can find out the number that come in through the salaried agents, while we can always find the number sent by the agents that are on commission. It does seem to me there is something wrong about that : it seems to me that the man who is working on commission gets the benefit of the work done by the salaried officer, as well as the land companies and the C.P.R.

A. It is quite true, that he gets a certain amount of benefit from the advertising that the department does, and the work of the salaried agents, but he is the local agent in a little town, or a certain district, and he is given, within that certain district or town, the right to issue certificates to those who are leaving there for Canada ; if a man goes to him and discusses Manitoba and the North-west Territories——

Q. Or if he goes to the man.

A. Or if he goes to the man, and the man says he is going to start for Canada, the agent gives him a certificate, but of course indirectly he gets the benefit of the work of the department through its own agent and its advertising.

Q. Is the list of agents published in your report ?

A. Excuse me, Mr. Wilson, I think I can have a statement made. It may take some little time to go through all the certificates issued by our own agents, aside from those issued by the local agents.

Q. Why was it not brought down with the other ?

A. We never regarded that as necessary information.

Q. I should think that is very important, because that would show the relative value of the agent on salary, and the agent on commission.

A. I do not think so at all; they work in together so much.

Q. And, apparently, they work in together so much that the agent on commission gets the benefit of the work done by the agent on salary.

By Mr. Wright :

Q. I suppose it works something in this way. Supposing a store had an advertising agent that advertises in all the different departments, and we keep an account of the sales that each salesman makes, the salesman gets the credit for the sales he actually makes, but he gets the benefit also of the advertising that our agent has done all over the country.

A. To some extent it works out in that way, but not so far in connection with this work as it would in your store.

By Mr. Clancy :

Q. I notice that you have a number of agents in the United States located near the border ; for instance, in the State of Michigan the most of your agents are located along or very near the frontier ?

A. Yes, in three cases.

Q. You have in three cases ?

Q. In three cases in Michigan, I think.

Q. Are they not nearly all on the frontier ?

A. There are three in Michigan, so far as the local agents are concerned.

Q. No, I mean the commission agents, those persons who work on commission.

A. I cannot tell you that.

Q. If you will turn to your report giving the name of the agents and locations, that is, of the agents on commission——

A. Not the sub-agents ; I did not give any list of sub-agents.

APPENDIX No. 2

By Mr. Wilson :

Q. You were to do that to-day, were you not ?

A. Not that I know of ; I have never heard of it. I do not think we have the sub-agents.

By Mr. Stephens :

Q. Do you have the locating of them ?

A. The salaried agents in a certain district appoint the local sub-agents in their own district.

By Mr. Sherritt :

Q. Are these sub-agents in Canada ?

A. None of them. They are usually men who are probably in the insurance business, or in some business in which they have an office where it will be convenient for people to call and get information.

Q. In every case they are Canadians, are they ?

A. No, not necessarily ; some of the best agents are Americans. I can bring down a list, if you like.

By Mr. Clancy :

Q. There is a list of the locations of sub-agents in Michigan, in last year's report, I think ?

A. It might be of interest to the Committee, if I bring down a statement of the agents who have earned anything, with the amount of money that each has earned, and their location. There are a great many agents who have not got anything.

By Mr. Wilson :

Q. You have the same system of commission applying in Great Britain and Ireland now ?

A. Not exactly the same.

Q. Would you bring down a statement with regard to that also, because I understand that you have made quite a radical change in the way you run your business there, and I would like to know what it is ?

A. I will come to that presently, if you will allow me.

By Mr. Clancy :

Q. I will just call your attention to page 366 of the report of the Select Standing Committee of last year, where the list is given of local commission agents in the United States on March 4, 1902. It gives, for the State of Michigan, a list of some 90 persons. Now, by examination of that list you will see that the greater part of these are located very near the Canadian frontier.

A. Yes.

Q. I will take, for instance, Vassar, North Branch, Albion— that is close to the frontier—Bessemer, Saginaw—comparatively close by—Gagetown, Unionville—I have knowledge of these places ; you will find that probably 90 per cent of these are very near the frontier, where they can catch persons that are coming back and forth, and they make use of this : it is merely a trick on their part to catch these persons and count them in, that is, all the transient persons that go back and forth.

A. Back and forth where ?

Q. Between the United States and Canada.

A. Not those that cross the line. The agents do not get commission unless they go to the North-west Territory.

Q. Not if they are going to the Lake St. John district ?

A. There are very few, if any, going into that district from there, not one in a year, hardly.

Q. But supposing they did ?

A. I do not think one of the sub-agents acts for the St. John district, for the government ; they are all for Manitoba and the North-west.

Q. Do they act for New Ontario ?

A. No, unless it is the part of New Ontario west of Port Arthur ; they might do it there, but I am not quite certain as to that ; I doubt whether they give any certificates even for that district ; certainly, they do not for the short distances, so that they would not issue certificates for persons going back and forth.

By the Chairman :

Q. The amount of money paid them will show, when you bring down the return ?

A. Yes ; it will not give perhaps exactly what you want, but it will give the amount that each of these men on the boundary are receiving.

By Mr. Schell :

Q. The return you are going to bring down will show if there is any trick in it ?

A. It might not show that exactly; but there can be no trick at all, because it is not only closely watched by our own agents, but by the Canadian Pacific Railway. We have had a great deal of trouble in this connection for years, because the Canadian Pacific Railway said that they were afraid the agents were sending in people to work at the lumber mills, and so on, in the Lake of the Woods, and, as a matter of fact, they refused in a number of cases to issue tickets on the certificates—they would not accept the certificates.

By Mr. Wilson :

Q. That might be easily worked, I should think ?

A. Of course, if the man is going to be absolutely dishonest, he could do a good deal.

Q. I have a great suspicion about that North Dakota man.

A. I do not know. North Dakota is the best field, as far as Manitoba and the North-west Territories are concerned.

By Mr. Schell :

Q. There is a large proportion of Canadians in North Dakota ?

A. Yes. However, I will bring that information. With reference to the question to which the Committee was referred, I may say that on page 12 of the report this year will be seen a list of homestead entries from the various states of the United States. In this it will be found that Dakota, to which reference has been made, has the largest number by far.

Q. Is that page 12 of your report ?

A. Yes. The number from Dakota was 1,732. Minnesota, an adjoining state, came next with 1,382. Then, the balance are all very much smaller in numbers, so it will be clearly seen that Dakota has, without doubt, furnished the largest number of settlers from the United States.

METHODS AND COST OF ADVERTISING IN THE UNITED STATES.

Regarding our work in the United States, I may perhaps simply repeat what has been stated to the Committee year after year by the Superintendent of Immigration, perhaps by myself as well, that our work is carried on along certain lines of advertising. Some years ago, we adopted the system of making special contracts with the

publishers of what are known as 'patent backs.' These papers are used, as the Committee know, very largely in the States, and those used in the Western States are printed in Chicago. Some are printed in St. Paul; I do not think there are any companies printing these 'patent backs' in that country. We have used those printed in Chicago and St. Paul, and this year have had advertisements and notices printed in 7,000 newspapers.

By Mr. Wilson :

Q. Would you describe to us the size of the advertisement ?

A. I have a sample. In addition to the advertisement, and what appears to us far better, are printed notices in another form to that of the advertisement which tells something about our country to people who would not look at the advertisements.

Q. Something like an editorial ?

A. Something like an editorial, a short article. For these advertisements we pay an average—the contract price, I think, is the same in every case—of 4 cents an inch. Here is a copy of one of them, and you will see that at the bottom of each advertisement we refer the reader to the agent in the particular state where this advertisement appears.

Q. That is, for each issue you pay 4 cents an inch ?

A. For each issue we pay 4 cents an inch. In each issue the advertisement occupies about 2 inches, so that it costs us 8 cents. We have these advertisements, as I say, in 7,000 newspapers.

By Mr. Schell :

Q. Eight cents each insertion ?

A. Eight cents each insertion, yes. In addition to that, each paper agrees to give little local notices which may be sent to them by the department, notices in regard to crops and other matters which it may be thought wise to send.

By Mr. Wilson :

Q. For which you do not pay ?

A. We do not pay for these, that is the understanding with them. These are some of these notices which have appeared.

By Mr. Blain :

Q. What is the average circulation of these notices and advertisements ?

A. We estimate a circulation of 1,000 for each paper ; that is 7,000,000 altogether. This is an expensive way of advertising, but I am satisfied it has brought about the results of the last few years in regard to the United States. We have adopted this plan of advertising and persisted in it, and I believe the success of immigration, both from the United States and Great Britain is very largely attributable to the advertising that is done in both these countries. Not only that, but we have persisted, as I pointed out to the Committee last week, and the result is always this : That when we advertise, we seem to be doing business ; we have tremendous numbers of inquiries from all over the country ; but the moment we cease to advertise, these inquiries drop off.

By Mr. Clancy :

Q. What time do you cease ?

A. We are about to close now until October or November.

By Mr. Wilson :

Q. This is about the time you naturally drop off, anyway ?

A. It is about the time we drop off, yes.

Q. The want of advertising does not account for that altogether ?

A. We have noticed that in the beginning and end of each season, when we delayed the advertising, our business seemed to have been put back ; and we have often done that for want of funds.

Q. I presume, Mr. Smart, you will attribute a large portion of the success of getting immigrants in this last few years to good crops. You had so much to talk about, and could present such a good showing.

A. There is no doubt about that ; we have used it.

By Mr. Blain :

Q. What is the average cost of the atlases you get out ?

A. We publish two or three kinds of atlases. They cost us from 3 cents to 8 cents each.

Q. Have you a sample there ?

A. I have two or three. They cost from 4 cents up to something like 8½ cents apiece. In addition to the advertising, we also, as the Committee know, from time to time bring delegates from the various states. For two or three years we undertook to bring over excursion parties of press associations, conducted by officers of the department, and we found that worked very well indeed. The editors who accompanied the excursions generally wrote up an account of their trip and the resources of the country generally, and in that way we have had a great deal of advertising in the Western States.

By Mr. Clancy :

Q. Is it the practice of the railways to give free passages ?

A. To delegates ?

Q. I mean, apart from the Department of Immigration.

A. They may ; I am not sure about that. They often give passes, I know, to people coming from the old country.

Q. Take persons who buy large quantities of land in there to resell, say from the Canadian Pacific ; is there not a large number of persons coming in through that channel, persons desirous of locating in the North-west ?

A. And getting free transportation ?

Q. Free transportation and otherwise.

A. I do not know anything about that. Certainly, a large number of settlers come in.

Q. No, I mean people who buy lands from the Canadian Pacific ; and the Canadian Pacific themselves, don't they do a large immigration business ?

A. Yes, I think they have done a good deal of advertising.

Q. Well, do you know if they have brought in a very large number of people ?

A. Yes, I think they have brought in several. I think that the general efforts being made by the department have brought in practically all the immigration that has been brought in.

Q. You seem to minimize it by saying they have brought in several. Is it not a fact that they have brought in a large number, if one is to judge from observation ?

A. Yes, I think they have.

By Mr. Wilson :

A. And land companies also ?

A. I think the land companies—there is this about it, you cannot take the thing separately ; you cannot undertake to say these land companies have brought them in. In fact, the advertising of the government for years has brought the land to the attention of people in the United States, and we would not have these people coming over, if there had not been a boom created in favour of Canada in the Western States. So

you cannot say the number of these people brought in by the land companies or by the government itself, but both have been working together.

By Mr. Clancy :

Q. You will understand, Mr. Smart, I am not minimizing the value of the immigration from the United States.

A. No, but I do not think your question is one that can be answered fully by a straight answer, without explanation.

Q. Have they not done a great deal ?

A. Yes, practically in the last year.

By Mr. Schell :

Q. Have you any way of ascertaining from results what is due to your department or what to the Canadian Pacific Railway ?

A. No, there is no possible way.

Q. It is purely a matter of opinion ?

A. Yes. We know, for many years there has been a large amount of money spent in advertising, and we know that within the last three or four years the result has been satisfactory, while for all the time previous it had been unsatisfactory.

By Mr. Clancy :

Q. You see, I do not ask that question about the proportion. I ask, what seems to appear on the surface, that they bear a large share with the efforts of the Immigration Department in bringing in immigration.

A. There is no doubt about that. The Canadian Pacific Railway, I may say, has done considerable in that way. The steamship people, as far as the Old Country is concerned, are always doing more or less advertising, so that, altogether, I cannot minimize the work of these agencies. They are all working to one end.

By Mr. Johnston (Cardwell) :

Q. Don't you think that the good crops of the last few years would have a much greater effect than the work of the agents ?

A. If we had had poor crops, we would have little to encourage immigration.

Q. All other agencies would play a small part, compared with the crops ?

A. The good crops, together with the work of the government and other agencies, certainly have done the work.

By Mr. Blain :

Q. Is your department working in conjunction with the local governments ?

A. No. The local governments are doing some work. In Manitoba the local government has expended a considerable amount of money in advertising.

Q. Has the Manitoba government any agents in the United States ?

A. Yes.

Q. Has the government of the province of Ontario ?

A. I do not think so. No.

By Mr. Wilson :

Q. They have not been doing anything lately ?

A. I do not think so. The only agent I know of that the Ontario government has outside of Ontario itself, is in Liverpool.

Q. You were to bring down some information with reference to the number of immigrants that came in between 1891 and 1901. You know, you brought down part of it at the last meeting, but only for the first five or six years, that is, the number

that came in by the ocean ports. You were to give those that came in by the United States. Have you got them ?

A. No, I have not that.

Q. I wanted all those that came into the country, not only by the seaports, but from every port.

A. I think I left a statement here the other day of that.

Q. No, you took it back, because it was not correct. You were also to bring down the number of days that the agents who were on salary travelled, and the days they spent in their offices.

A. I do not know why it has not been brought down.

Q. You get a memo. every week of the operations of the agents ?

A. Yes, we get a weekly diary.

Q. All you have to do is to make a tabulated statement ?

A. Their accounts are always checked up with the diaries to see that they are really at the places given in the account.

By Mr. Blain :

Q. Could you give us the cost of that atlas of Western Canada ?

A. I cannot tell you. I think it is about 4 cents.

By Mr. LaRivière :

Q. While you are on that, I see in the copy book here, which is intended to be distributed in the schools of the old country for immigration purposes, you have the statement : 'Ontario is the wealthiest province in Canada.' On what authority do you publish that statement ?

A. I do not know that I ever saw that before.

Q. You said that immigration has been assisted a good deal by other private corporations and colonizing companies, and so on. I would like to ask you if you know anything of the Haslam Land Investment Company ?

A. No, I never heard of it.

Q. Have you seen in the public press a statement, that they have brought out a large number of immigrants to settle on lands controlled by himself along the Sault line—that Mr. Haslam has done this ?

A. Oh, I have heard of that company. They are operating in St. Paul and Winnipeg. I did not know that they brought out a large number. I know they have an office in St. Paul, and they are doing a large business.

Q. Were commissions allowed by your sub-agents to any of the immigrants alleged to have been brought in by that company ?

A. I cannot answer that. If we had the names, I could, but I cannot tell you without them.

Q. You only pay the commission when the people have settled down on lands ?

A. We pay the commission when the certificates are returned to us.

Q. Certificates of settlement ?

A. No, the certificates granted by the agents in the United States.

Q. On arrival ?

A. No, a certificate which entitled the American intending to settle to a reduced rate of transportation.

Q. Upon what is that based, the arrival or the settlement ?

A. If a man and his family are sent by an agent to settle in the west, they are given a certificate saying they are *bona fide* settlers going into the country to settle. The settler takes that with him and at the boundary goes into the ticket office and presents that, and when he presents that, he gets the ticket at a very much reduced rate to his destination. That certificate is then returned by the Canadian Pacific Railway to their head office at Montreal, and then back to us, and when it comes to us, we pay the bonus or the commission to the agent who issued the certificate.

Q. And do you mean to say this bounty is paid by the government on such immigrants as those who actually pass through Manitoba and go to the Western States ?

A. Oh, no, not to the Western States.

Q. You saw it again in the papers, the other day, that quite a number have been refused at the boundary because they could not pass examination ?

A. These were European altogether, not American. I am speaking of Americans. So far as Europeans are concerned, we do not pay commissions on them at all.

Q. Were the homestead lands sold to him or his company on the condition that he was to bring in settlers ? Have you had any agreement or arrangement with the company ?

A. No.

Q. About homestead lands ?

A. No, there is no agreement at all.

Q. Nothing at all ?

A. No.

Q. Well, did the government give this company any assistance in any way ? And if any of the homestead lands were reserved or sold to this company, to what extent and to what distance ?

A. None that I know of ; I never heard of any.

RESERVED LANDS FOR THE BARR COLONISTS.

Q. Now, in regard to the Barr colony, can you state what number of homesteads have been reserved ? You did the other day. You mentioned the amount of money deposited. On how many have the homestead fees been actually paid over ? Have the names been furnished to the department of the parties for whom these homestead entries were made ?

A. Up to the number of about 1,400 or 1,500.

Q. Who made the declarations and entries for these parties ?

A. They are making them now.

Q. Themselves ?

A. Very largely themselves. Most of them.

Q. Has any arrangement been made by which the time limit for going into residence has been extended beyond the six months of the Dominion Lands Act ?

A. No, although there has been a suggestion that if some of them are unable to go on the lands for good reasons, the time shall be extended until next spring.

Q. It would be but fair.

A. Yes, we do that.

Q. In view of the fact that a large number of the Barr colonists have not gone into the reserve, but have located on lands in the districts around Battleford or other places in the west, do you not think the number of homesteads reserved unnecessarily large ?

A. We reserved, in the first case, the even sections at our disposal in 17 townships. In addition to that, we set apart homesteads to the extent of about three-quarters of the available homesteads in forty further townships, when we knew the number was going to be very much greater than was expected at first. Since, however, going out there, many of the people have decided that they would not go as far as the reserve at all, and a great many of these are now locating immediately in the vicinity of Battleford, so that, so far as the reserve is concerned, I think that in perhaps a few months there will be no such thing as a reservation. We have our own representatives there to attend to the looking after these people and locating them, and, as it is known Mr. Barr is not now in any way connected with this colony, they are not in the same sense a colony, but are rather inclined to the opinion that we suggested to them in the beginning, that it would be as well for them to mix up with the other people who have gone into the country, and learn some of the other conditions from their neighbours.

That would be an advantage to them. So far as the reserve is concerned, I may say that a lot of the land was found to be not as desirable as the settlers expected. There was some timber on it, and some land that was rather inferior in quality, and on the whole a great many of them decided they would prefer going outside the reserve altogether to locate their homesteads.

Q. So that a good deal of that reserve will be thrown open ?

A. Yes. It was not intended, in any event, to give them all the land, because we reserved the right for other settlers to go in.

Q. Who are the owners of the land ?

A. I think the Canadian Pacific Railway land grant extends there.

Q. You are not aware whether they sold it to any company ?

A. I did hear they had sold some land to private individuals.

By Mr. Wilson :

Q. Do they report to you the lands sold ?

A. Not until they ask for the patents.

By Mr. LaRivière :

Q. Have you heard of the Eastern and Western Land Corporation ?

A. No.

Q. So you do not know what tract of country they own ?

A. No.

Q. I think that the government ought to follow all these organizations in the west that are taking a lively interest in the settlement of the people, and in some cases, perhaps, they should be watched.

A. I think they are taking a lively interest in the settlement of people, but a livelier interest in the sale of their land. We would not undertake to follow every individual or little land company that deals in lands. They are not buying our lands, but railway company lands.

THE SASKATCHEWAN VALLEY LAND COMPANY.

Q. The government do not sell any large quantity. The odd sections remain in possession of the company. The Land Act prohibits the government from selling more than 640 acres to any individual, but the government has not sold any land at all ?

A. The only lands the government have sold, or agreed to dispose of, are the lands of the Saskatchewan Valley Land Company, the company who bought the land grant of the Long Lake Railway, north of Regina.

Q. Did the government sell them the balance of the land ?

A. No, the government agreed to sell on certain conditions 250,000 acres of land at $1 an acre, the condition being that the settlement——

Q. That is the Manitoba and Saskatchewan Land Company ?

A. No, that is the Saskatchewan Valley Land Company. That is the only company the government has sold any land to at all.

Q. Well, who controls that company, who are the directors ?

A. I cannot tell you that. Colonel Davidson, I think, is president.

Q. Have you made the deal with them ?

A. We did not make it with the company at all. It was to the individual purchasers ; but these men have since formed themselves into the Saskatchewan Valley Land Company. Colonel Davidson is the leader of the company, and I have forgotten the names of the others, except two or three.

Q. You have agreed to sell to them ?

A. On certain conditions.

Q. Settlement conditions ?

A. Yes. We sold to them these lands with the idea, at least the idea in the mind of the minister at the time was, that this tract of country, which for 75 miles had not a settler in it, was said to be very inferior land. These people came and said : 'Here we are, willing to purchase on certain settlement conditions a tract of land.' I think they asked at first for 500,000 acres. At last, it was agreed we should sell them 250,000 acres in this tract on condition that they should locate twenty settlers in each township on free homesteads; that they should locate twelve further settlers on lands which they would sell to these settlers, making thirty-two in all, or exactly one-half the number of even-numbered sections open for homesteading in a township. When this was done, they would have the right to purchase the balance of the lands in the township. Up to the present they have not fulfilled, so far as I am aware, the conditions of the purchase, but they have a year yet: they have two years given to them to fulfil these conditions.

Q. How much did they pay the Regina and Long Lake Company ?

A. I do not know ; I think they paid them $1.75 per acre.

Q. The published report is, that they paid more than that.

A. No, I think that $1.75 is the rate.

By Mr. Wilson :

Q. Whom do they have to buy the odd sections from ?

A. From the railway company. I may explain that this land grant, this grant of land, was set apart by certain Orders in Council for the Regina and Long Lake Railway. Under the contract with the railway, the government was to furnish them with lands fit for settlement. For a number of years the railway company was coming to the government, demanding that they should furnish them with lands fit for settlement. They said that these lands along the line which were set apart for them, were absolutely unfit for settlement and were not in accordance with the terms of the contract, and they wanted the government to furnish them with other land. The case was taken up for two or three years with a view of settlement, and in the end the department offered to give them almost any land available that was at the disposal of the government, to settle the question, rather than to have a lawsuit over it. The company refused that, and immediately went into court, and issued a writ, and the case was to be tried in the Exchèquer Court, when this company, it appears, made a proposition to the railway company to purchase those lands. The company then came to the government with the suggestion that they were purchasing this land grant, and asked if we would dispose of 500,000 acres to them on certain settlement conditions, so that the government thought it was wise to settle the whole question and to encourage the company by disposing of a certain portion of these particular sections of land at a very low rate, at what was considered a fairly low rate at that time. Of course, the suit was immediately withdrawn from the court, and the land company accepted their lands then as giving this land grant, and the whole case was closed out. That is the history of the purchase of that land, as far as I am aware of the details.

By Mr. Richardson :

Q. What is the name of the company ?

A. The Saskatchewan Valley Land Company. We had no dealings with the company at all. Our dealings were with certain individuals. I think there were two others, besides Colonel Davidson, Mr. McRae and Mr. MacDonald.

By Mr. LaRivière :

Q. They were middlemen ?

A. These are the men who formed the company.

Q. Is it not possible to get the names ?

A. I can get the names, I suppose. They are a Canadian corporation.

Q. Could you not undertake to supply the Committee with a list of the names ?

The CHAIRMAN.—That is outside his department. I think the question is scarcely pertinent : the composition of the company has nothing to do with the Department of the Interior.

Q. It is the composition of a company that deals with the Department of the Interior. I think we have a right to know everything about it.

The CHAIRMAN.—As far as I understand the Deputy Minister, he gives the names of the parties with whom the government transacted this business.

Q. I ask if you are able to supply, if not to-day, at a future date, the list of the shareholders of the company and its directors ?

A. I can say now, I cannot give that. I can furnish you with a list of the names of the purchasers of the land.

Q. They were only middlemen, as I understand it. They have transferred their interest to a company; but at the same time you are dealing with a company, not with the middlemen.

A. We are not dealing with the company, we have nothing to do with the company.

By Mr. Schell.

Q. You never did deal with a company ?

A. No.

By Mr. Larivière :

Q. These men have disappeared under the company ?

A. There is no question that these men have formed a company since the purchase.

IMMIGRANT RATES AND RATES PAID TO BOOKING AGENTS.

By Mr. Ross (Ontario) :

Q. Does your department assist immigrants into this country ?

A. Direct assistance, in the way of transportation ?

Q. No, I mean assistance in any way, directly to the immigrants.

A. Before coming to the country ?

Q. Yes.

A. No.

Q. I understand the assistance that is given is in the shape of reduced transportation fares, if they can be got for them ?

A. You are speaking of expenditure by the department to assist them ?

Q. Yes.

A. No, there is nothing of that kind.

Q. If you can secure them a reduced transportation rate, you will do so ?

A. Yes, we have always done that.

Q. And besides that, I understand the booking agent who secures the immigrant would be entitled to a commission from the company, but not from the department.

A. No. The booking agents get commissions from the steamship company and from the department as well.

Q. That is practically the commission that you pay to the agent ?

A. We pay on a certain class of immigrants, agriculturists coming here with the intention of farming, with the intention of entering upon agricultural pursuits.

By Mr. Wilson :

Q. What do you pay ?

A. Seven shillings in the old country to the ordinary booking agent, and twelve shillings to those we have appointed to do special work for us in the localities as local agents. The local agents are, in nearly every case, booking agents.

APPENDIX No. 2

By Mr. Ross (Ontario) :

Q. Must the immigrants settle on the land before that is paid ?
A. No.

By Mr. Sproule :

Q. That includes women and children ?
A. The commission is paid on whole and half tickets.

By Mr. Wilson :

Q. Up to what age is the half ticket ?
A. From five to fifteen years, I think.
Q. Nothing under five years ?
A. I think not.

By Mr. Ross (Ontario) :

Q. There must be an idea in this country that the government assists immigrants into the country, because we have had a number of petitions praying that the government will not assist immigration.

A. I presume these are from labour organizations, are they not ?

Q. Yes.

A. I do not know what they mean in the way of direct assistance. I think probably what that means is to do without immigration effort altogether, not to expend any money in that way. At least that is my impression. Although there has been an impression abroad that we give assistance in the way of transportation, it has never been the policy, so long as I have been here, to do anything of that kind.

By Mr. Wilson :

Q. You did assist the Welshmen from Patagonia ?
A. At the rate of $6 per head.
Q. That is all ?
A. That is all.
Q. But that did not include the expenses of your agents ?
A. Not the expenses of an agent who went to Patagonia to start the movement.
Q. That did not cover the expenses of your agents ?

A. No, that is outside. We gave $6 per head to the Welsh Committee in Wales who had the matter in hand.

Q. Now, did I understand you rightly, when you said you paid no commission on the Barr colonists ?
A. We have not paid any commission to booking agents.
Q. Nor to Mr. Barr ?
A. No.
Q. So it has cost the government nothing ?
A. Excepting what we are spending in the ordinary course.

By Mr. Schell :

Q. Nothing in the way of assisted fare ?
A. No.

SASKATCHEWAN VALLEY LAND COMPANY.

By Mr. LaRivière :

Q. Now, to come back to the Saskatchewan Valley Land Company ; your agents induce immigrants to go into that district and settle on that land ?

A. Our agents do not induce immigrants to go on any land. The instructions are to give a general description of the country and allow immigrants to choose for themselves where they will go. It is well to say that immigrants are not induced to settle in any particular place ; they generally visit a district and see what it is like for themselves before they settle.

Q. So no inducements are given by outside agents to go on land bought by this company ?

A. I do not know. It is quite possible that, on the people coming in and locating there, the agents will get commission. I will not say definitely. If the local agents issue a certificate, they would certainly get the commission.

By Mr. Wilson :

Q. We should have the information.

A. There is no doubt in my mind at all. If a local agent issues a certificate, he will get a commission.

By Mr. Ross (Ontario) :

Q. Whether the immigrant goes on that land or not ?

A. Whether he goes on that land or not ; the sub-agent, I mean.

By Mr. Wilson :

Q. Those appointed by some government agent as sub-agents ?

A. Yes, he only receives remuneration by way of commission.

THE SCRIP SYSTEM.

By Mr. LaRivière :

Q. Can the purchase price of this land be paid either in cash or scrip ?

A. This land ?

Q. You have sold, of your land, or you have agreed to sell, 250,000 acres ; will they be able to pay in cash or in scrip ?

A. Yes. Any land bought by a land purchaser can be paid for in scrip. The government cannot refuse scrip from any purchaser.

Q. Were any privileges, in the way of special trains or fares, given to people to inspect these lands ?

A. No.

By Mr. Ross (Ontario) :

Q. Is there much scrip out ?

A. Considerable. You mean money scrip ?

Q. You have two kinds ?

A. Yes, money and land.

Q. You have considerable out?

A. The land scrip is nearly all in, but money scrip will be outstanding till paid in for land.

Q. How much money scrip have you ; I mean the individual scrip, what is the net total, $200, $250 ?

A. To each person ?

Q. Yes.

A. Two hundred and forty dollars.

Q. Two hundred and forty dollars ?

A. In denominations of $160 and $80.

Q. Two denominations ?

A. Yes.

Q. Why two denominations ?

A. It makes it easier to use it. In purchasing land, say at $1 an acre, and taking a quarter section, 160 acres, it would make it come out even and square the account. It is an old practice, adopted many years ago.

By Mr. LaRivière :

Q. How have you come to accept scrip in broken denominations in payment of land from brokers ? Suppose I want to pay $150 for land, I go to a broker and buy scrip for $150 ; that is, I do not buy it, but he gives me an——

A. An order ?

Q. He gives me an order, and I go to a land office and get this recognized for $150. How is that ?

A. The scrip, I may explain to the Committee, is issued largely to three or four large concerns, and they applied to us on behalf of the people ; it is in the interests of the people who should purchase land, or who want to pay the government money for lands that have been purchased, to open an account with them similar to a bank account. They will deposit with us, say, $1,000 for scrip, and we will charge it up against them, the same as cheques are charged up in a bank. That gives the full benefit of the value of the scrip to persons wanting to pay for land. Previous to that, persons holding scrip lost largely.

Q. If a man wanted to pay $160 or so, he would have to buy $240 worth of scrip ?

A. If paying it all in scrip, and some have applied all the way from $160 to $240.

By Mr. Schell :

Q. You do not take it and pay back money ?

A. No, we do not pay any money at all.

By Mr. McEwen :

Q. How long has it been issued ?

A. Four years. This work has been going on, but is practically all completed.

By Mr. Ross (Ontario) :

Q. All issued ?

A. All issued now ; practically closed up.

By Mr. LaRivière :

Q. Except the Crees ?

A. Yes, they are not quite settled.

It is a general idea, that it is comparatively easy for the department and those of its agents in the United States to do work there. I want to draw attention to the fact that up to the present it has been comparatively easy, but, owing to the advertising this country is getting, it has stirred up opposition in the United States which is going to be hard to overcome.

OPPOSITION TO EMIGRATION TO CANADA.

By Mr. Wilson :

Q. I wonder it didn't do it before.

A. The newspapers in various States have taken a decided stand in regard to emigration to Canada. They publish articles in which they decry Canada and praise their own country. They publish letters from people who have gone to the North-west and who have returned to the United States, in order to prevent a further emigration from the United States. It is only a few months ago that I noticed a complaint made at

some church conference in New York, that some particular parish or district was being practically depopulated by people going to North-western Canada. So this thing has got to such a position now, that in various localities there are strongly organized movements to prevent further exodus to Canada. It has got to this, that not only are the people and the railways assisting to retard emigration to Canada, but the Minnesota legislature has passed an appropriation for a commissioner of immigration, who would publish documents and authentic information regarding the lands belonging to the federal government open to homestead, and otherwise praising the advantages of the State of Manitoba, very large extents of which are now open for homesteading. The same thing is going on in Wisconsin, and we have been considering the withdrawing of one of the agents there and transferring him elsewhere, on account of the strong opposition he has met with there.

Q. This is nothing new ; it was so there years ago.

A. I did not know it. There is an impression abroad, that the lands of the United States are all taken up and that people have to come to Canada, but that is quite a mistake.

By Mr. Ross (Ontario) :

Q. It is, for they have lots of land in Texas and Kansas.

A. According to a statement which Mr. Johnson, the Dominion Statistician, has furnished me, there are still available for settlement about 600,000,000 acres of land in the United States, outside of Alaska, and of these, about half have been surveyed. In some respects the laws of the United States are more stringent than in Canada in respect of homesteading, but on the whole they are not dissimilar, and the man has no special advantage in coming to Canada over his own country, excepting that he will come to a better country and take up better land.

By Mr. Wilson :

Q. They certainly show no anxiety in the way of getting people to come to the country.

A. If one looks over their reports, he would come to the conclusion that nine-tenths of the people who enter the United States are not such as would come here.

Q. I would take it the other way.

A. I think you will find it as I say.

By Mr. Ross (Ontario) :

Q. They are Russian Jews and Italians, largely ; that is the immigration of the last few years in the United States.

A. Italy furnished, all told, according to the last report, 178,375 persons ; Austro-Hungary, 171,939, and Russia, 107,347, or over 70 per cent of the total immigration; and I understand from American officials that practically all the immigration into the United States goes to the cities and towns. They say that the proportion that goes to the country is very small.

INSPECTION OF IMMIGRANTS.

By Mr. Wilson :

Q. Are you aware that they have a very strict inspection before they allow them to get on board ship ?

A. I think the American commissioners in Canada are more strict than on their own territory.

Q. Less than one per cent of their immigrants are rejected as a result of that very strict inspection in the country from whence they sailed, and if you believe Mr. Watchorn, the great bulk of them sail for Canada.

A. Where are the inspectors of the United States in Europe ?

Q. You certainly have not read this report of Mr. Watchorn's. He went over last year for that purpose.

A. What did he do ?

Q. He made a report on the different ports he visited and the inspection made before immigrants were allowed on board ship.

A. This is simply what the steamship people do; we have the same. I say there is no doubt these American commissioners in Canada are far more strict in not allowing these foreigners to pass over from Canada than they are with immigrants arriving at their own doors. And the reason is this, that the steamship people are trying to stop the traffic from coming by Canada.

By Mr. Ross (Ontario):

Q. And want them to go in by the States ?

A. Yes, no doubt about that.

By Mr. Wilson :

Q. Last session Congress doubled the head tax and made steamship companies liable who brought in immigrants who, on their inspection at the port of arrival, were found to be among the prohibited classes, and such as should have been prevented from embarking; and besides having to deport these people the company was liable to a fine of $100. From the report of the Commissioner General of Immigration of the United States, dated June 30, 1902, I take this report of Mr. Watchorn's : 'From this report it will be seen that these aliens classified as Canadian immigrants, but who are simply so classified to conceal their real intentions, furnish in the aggregate a greater amount of specific disease and general inadmissibility than all the immigrants examined at all the United States ocean ports of entry combined, including Quebec, St. John and Halifax. At first glance this may be regarded as an extravagant statement, but an analysis of the records of all the above-mentioned and a comparison thereof with the statistical records herewith submitted will amply attest its incontrovertibility.' That is a pretty rough statement as to the kind of people who come in here.

A. Well, the examination is just the same for the United States as for Canada.

By Mr. Ross (Ontario):

Q. I would take a statement of that kind from a United States commissioner regarding immigration coming to this country with a grain of salt. I am not saying he is not stating facts that may be facts from his idea of things, but it is to the advantage of the States to have them travel by American lines and they want them to go direct to the country.

A. Over American lines.

Q. And I can understand that some of their reports would be coloured.

A. It is a remarkable thing.

By Mr. Wilson :

Q. I can understand Mr. Ross saying this because he has not read this report at all. As they increased the stringency of their laws the immigration through Canada increased. In 1897, there came in 6,542 people destined for the States; in 1898, there were 7,344 ; in 1899, there were 11,550, in 1900, there were 20,011, in 1901, there were 21,674, and in 1902, there were 29,199, showing that as the law became more strict as to their entrance to the United States the agents instructed them to come to Canada and get through by that way.

A. He does not say that exactly.

Q. Yes, he does in his report.

A. That this is the reason ?

Q. And that they are instructed to make Canada their destination for that reason ?

A. I think I am safe in saying that statement is absolutely wrong. The large increase in the number of American bound immigrants who travel through Canada was owing to the efforts of the Elder-Dempster Company in its enterprise in quoting a lower rate. Not being in the combination and not being under the control of any steamship conference they quoted a lower rate and brought over all these people. They have brought nearly all those brought from Europe in the last few years; showing the inducement was the lower rate.

By Mr. Ross (Ontario) :

Q. I was reading the report of the Commissioner of Immigration for the United States, in which he said that immigration to the United States was largely from Western Europe in the decade between 1880 and 1890 ; and since then it had been from Eastern Europe, from Russia, Armenia, all down through Asia Minor, Italy and Greece, and all through there. That seems to be the trend of their immigration now, from Eastern Europe ; Western Europe seems to have sent out all its immigrants during the previous decade. Where do the Elder-Dempster Company get these people, in the Mediterranean, at the point of embarkation, or do they go to a British port to be embarked ?

A. I do not know how it is done, but it is the general agent at Rotterdam who has charge of all the business.

Q. They send them up there ?

A. Their headquarters are at Rotterdam and Antwerp, and they send out their circulars from these points. Their emigrants cross from there to England, to London and Liverpool, and from there sail to a Canadian port. But the fact is, that the rates were reduced by agents not in the conference, and all the others were compelled to follow.

By Mr. Wilson :

Q. There is a special report by Mr. Watchorn from Paris, dated August 22, 1902, in which he says : 'All these agents observe the United States laws and regulations by subjecting all their patrons to a proper examination, and by accepting only admissible cases, but with one accord they either sell the rejected ones' tickets to Montreal or send them to the Beaver Line agent, who allows them a partial commission for all such cases.' Then he says over here, further on : 'He showed me his figures for what he said represented this year's business, which show that he, during that time, sent 1,230 emigrants to Canadian towns, and 30 direct to New York by way of Quebec.' Now, that does look to me, if there is any truth in it, that their inspection is more strict than ours.

A. But I might point out that, as far as our own ports were concerned, we had no officers examining these diseases which are objectionable to the American authorities, till December last, while this report on immigration is to be June 30, last. His ideas now are different. Mr. Scott has to-day received a communication from Mr. Watchorn, expressing his satisfaction with our arrangements. Our examination is now as strict as the American.

By Mr. Ross (Ontario) :

Q. Have you that letter ?

A. Mr. Scott has not got it here.

Q. In view of these questions, will you file that letter ?

A. I will.

By Mr. Wilson :

Q. Mr. Watchorn says that a large number of people have been trying to get into the States from Canada. Some have, and some have not?

APPENDIX No. 2

A. I explained at last meeting that we have had 1,200 such apply for certificates, and 377, I think, were refused. I have no details as to the ground of refusal. There may be more than disease. We have not the money standard the United States have. If you read Mr. Watchorn's report, you will find that the average amount of money in the possession of people landing in the United States is very small, only some five or six dollars.

By Mr. Ross (Ontario):

Q. Do you examine people going to the States ?
A. Our doctors do if they are rejected.
Q. Do you put up a standard that a man must have so much money to be allowed to land in Canada ?
A. No, but if a man is a pauper, that is if he cannot earn a living, we deport him.

By Mr. Wilson :

Q. You have done that ?
A. Yes, we have.

INCREASE OF IMMIGRATION—COMPARISON OF YEARS.

If you allow me to give a statement I think it would be of interest to the committee to have some idea of the immigration work this year. I simply want to give you the totals. The returns for the month of May, the month ending last Sunday, showed that the arrivals from Britain numbered 10,138, from the continent of Europe 8,254, and from the United States 6,100, making a total of 24,492, the largest month we ever had in our immigration work in Canada. Then the statement for the eleven months of this fiscal year ending on May 31 shows that the British arrivals numbered 35,670, the arrivals from the continent were 31,429, and from the United States 37,617, making a total for the eleven months of this fiscal year of 104,716 people. When the full returns for the year are in, I have no doubt that this year's immigration will amount to 120,000, which is nearly double the last year and that was the largest we ever had before.

By Mr. Richardson :

Q. You say there are 600,000,000 acres of land still available for settlement in the United States ?
A. Yes.
Q. What is the estimated area of land still open in Canada ?
A. I do not know that we have any estimate. We estimate that in Manitoba and the North-west Territories we have about 300,000,000 acres of available land; that is including Athabasca.

By Mr. Ross (Ontario):

Q. But you do not include Keewatin or Mackenzie ?
A. Or Ontario, no.

By Mr. Wilson :

Q. I wish to correct that statement you have just made about this being the largest immigration we have ever had. If you go back to 1883-4 you will find that it was 112,000.
A. But the returns are absolutely unreliable.
Q. I think about 1899 or thereabouts we had a statement here that the immigration amounted to 44,000, but when it came to be pinned down we could not get them all accounted for. How do we know that your present returns are any more reliable ?

A. I might give the committee some information on that point. The homestead entries in 1901, for eleven months of the fiscal year, were 7,138, for the eleven months of 1902, they were 11,885, and for the eleven months of 1903 up to the 31st of May, there were 26,694, which is nearly two and one half times as many as the year before. There is no clearer indication of immigration than the homestead entries, and the largest year we ever had in the eighties, that is from 1880 to 1890, was in 1882, and they numbered that year either 7,300 or 7,800—I am not sure which, but the report will show—so that this year shows double last year and last year was much the largest we ever had.

Q. All we speak from here is the reports we get.

A. You had certainly better bring Mr. Boardman here to get his statement regarding these statements made previously, because he positively informed me, and says so to-day, that the returns made up then were duplications, that when he had made up the statement of the arrivals at sea-ports he added a certain number for those reported by customs houses.

Q. Was he instructed to do so ?

A. I do not know, I never asked him that.

Q. I do not know Mr. Boardman at all, but it seems to me that a man who will make such statements as these to the deputy minister of the department he is working in should be scrutinized, because his work is useless.

A. Mr. Wilson, you spoke about one year better than this ?

Q. Yes, 1883.

A. In 1883, the figures were 7,200 according to Mr. Boardman.

Q. Well, sir, I will take you down to the public documents and show you.

A. He says that in 1890 the arrivals were 103,854, bound for the United States.

Q. Well, one year was 112,000, because I took a note of it.

A. Mr. Boardman also states to me that his statement of statistics shows that in the ten years from 1881 to 1890 there passed through Canadian ports 729,616 passengers to the United States. In addition, there were 578,846 persons declared for Canada, to which being added 307,331 for customs entries, made a total number placed in the returns, of 886,177.

By Mr. LaRivière :

Q. That is for ten years ?

A. That is for ten years. His statement goes on to say that, as a matter of fact, there were included in these customs entries 195,244 returned Canadians, so that the total net number of asserted new residents would be 690,933. At the census of 1881 there were 609,318 foreign born, and at the census of 1891 this was increased to 647,362, giving an increase of 38,044. To this must be added the loss by death upon the 609,318, which may be estimated to amount to 98,710, and the result is to give a net inward movement of 136,754 for the ten years.

By Mr. Wilson :

Q. That is just a tabulated statement ?

A. Yes. He goes on to say: 'It must also be borne in mind that the was undoubtedly considerable overlapping between the various inland ports of entry and the customs entries, and also an important backward movement to Europe, which is shown on table "B," where it is to be seen that by the British Board of Trade Returns there was a return movement of 21 per cent from British North America and of 32 per cent from the United States ; the difference in the return rates being shown by table "C," which establishes that there was a known passenger traffic of 23 per cent at the strictly Canadian ports, whilst the British Board of Trade takes no notice of final destinations, but deals entirely with ports of arrival and departure.'

Q. Is he doing the same work for you now ?

A. Well, he makes up the returns for the ocean ports ; that is all he does.

Q. I suppose he is as reliable as before ?

A. I do not doubt at all but the returns there show—the numbers are in that return—but when you look at the names of the places, the ports, such as the Suspension Bridge, thousands of people are crossing the Suspension Bridge, and there are 9,000 at Vancouver ; I suppose there are Chinamen there, all added to the list ; I think it is very clear.

Q. I think it will show that there is a great difficulty.

A. There is no doubt there will always be a small portion of the population going out.

By Mr. Richardson :

Q. Some reference was made a little while ago to 'land scrip' and 'money scrip.' To some parties who read these reports they may not know what this scrip is. You might tell us to whom it is first issued and how it goes into circulation as a medium of exchange. Give the explanation to the committee, please.

A. I can give you an explanation in a very few words. The whole thing is based upon the quieting of the title to the land. It is assumed, whether there is anything in the assumption or not, that the half-breed population had some claim upon the Dominion government ; the Indians had, and they had their claim wiped out by treaty; certain payments were made, and certain lands set apart, and having certain provisions made for their education, and so on. It is assumed that the half-breeds had some native right to the soil. The government issues a commission with the idea of satisfying that claim by the issue of scrip, which means dollars and cents. They issue two kinds of scrip, one we call money scrip : and in each case where it is clearly set out that this half-breed was born in the North-west Territories, for instance, prior to 1885, one scrip is issued to him : he has his choice whether he will take $240—that is, scrip ; we take it for that amount in payment of Dominion lands—or whether he will take scrip which entitles him individually, or personally, to 240 acres of land. The commissioners go out and take evidence as to the birth of these persons, where they were born, the date, and so on ; they take all the evidence they can get concerning these facts. Then the commissioners decide, we will say, favourably to the half-breed ; he then elects whether he will take money scrip or land scrip. He can take scrip worth $240 in payment of Dominion lands, or he can take the land, and he makes his own location, and that is the whole story.

Q. And he can dispose of it ?

A. He can dispose of the money scrip, but he must make the entry himself, personally for the land.

By Mr. LaRivière :

Q. Is that not done by agents ?

A. No.

By Mr. McGowan :

Q. Has he to make the settlement duties or not ?

A. No, he is entitled to 240 acres of land free.

This is the statement, Mr. Wilson, of the newspapers doing business with the Department which you asked me to prepare. Will you allow me to put this in ?

Mr. WILSON.—Yes.

Statement produced and handed in as follows :—

LIST OF UNITED STATES NEWSPAPERS IN WHICH CANADIAN LANDS ARE ADVERTISED.

Name of Newspaper.	*Land Company, &c.*
Dubuque Enterprise, Iowa	T. J. Masterson, Dubuque, Iowa.
Wallace's Farmer, Des Moines, Iowa	Saskatchewan Valley Land Company, 305 Jackson St., St. Paul, Minn.
St. Paul Trade Journal, St. Paul, Minn	Saskatchewan Valley Land Company.
The Farmer, St. Paul, Minn	" " "
Minneapolis Tribune, Minneapolis, Minn	" " "
" "	The Haslam Land and Investment Co.
" "	St. Paul, Minn., & Winnipeg, Man.
The Western Presbyterian, Minneapolis, Minn.	Manitoba Land & Investment Company, Winnipeg, Man.
St. Paul Pioneer Press, St. Paul, Minn	North-west Colonization Company.
" "	St. Paul, Minn., Winnipeg, Man., Estevan, Assa.
St. Paul Farmer, St. Paul, Minn	Saskatchewan Valley Land Company.
The Minneapolis Journal	" " "
The Farmer, St. Paul, Minn	James Scott, Real Estate agent, Winnipeg, Man.
" "	The C. R. Gordon Land Company, Winnipeg.
Wallace's Farmer, Des Moines, Iowa	Canadian Pacific Railway Company.
The Homestead, Des Moines, Iowa	Nares, Robinson & Black, Winnipeg.
The St. Paul Farmer	J. A. Elton, Real Estate Broker, Winnipeg, Man.
" "	Union Colonization Company, Winnipeg.
" "	Nares, Robinson & Black, Winnipeg.
" "	Johnson, Scott & Bennett, Winnipeg.
Des Moines Capital, Des Moines, Iowa	Haslam Land & Investment Company, St. Paul, Minn., & Winnipeg.
" "	C.P.R. Lands, Canada North-west Land Company.
" "	Nares, Robinson & Black, Winnipeg.
" "	Carruthers, Brock & Johnston, Winnipeg.
" "	T. D. Cavanagh & D. A. Mackenzie, Winnipeg.
" "	Hudson's Bay Company, Winnipeg, Man.
" "	Oldfield & Gardner, Winnipeg.
" "	Osler, Hammond & Nanton, Winnipeg.
" "	Dalton & Grassie, Winnipeg.
" "	John A. Davidson, Winnipeg, Provincial Lands Commissioner.
" "	Theo. A. Burrows, Winnipeg, Land Commissioner, C.N. Railway Lands.
" "	The C. R. Gordon Land Company, Winnipeg, Man.
" "	Edwards & Patterson, Winnipeg.
" "	Funk & Ferguson, Winnipeg.
" "	Akins & Pepler, Winnipeg.
" "	Fry & Smith, Winnipeg.
" "	James W. Bettes, Winnipeg.
" "	Wm. Pearson & Co., Winnipeg, Man.

APPENDIX No. 2

HOUSE OF COMMONS,
COMMITTEE ROOM 34,
WEDNESDAY, June 10, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock, a.m., Mr. DOUGLAS, Chairman, presiding.

Mr. JAMES A. SMART, Deputy Minister of the Interior, was present by call of the Committee, and examined as follows:—

Mr. Chairman, I was requested at the last meeting of the Committee to submit a statement of immigrant arrivals from the United States from the year 1873 down to 1901-02. In presenting the statement, I desire to state that for the years 1892, 1893, 1894, 1895, 1896 and 1897 the records are not complete ; there is no record in the department upon which we can make a full statement as to the number of arrivals for those years.

By Mr. Wilson :

Q. Is there no record in the Agricultural Department ?

A. These are partly compiled from the Agriculture records ; all the records from that department with reference to immigration were transferred to the Department of the Interior.

Q. That is more information than you gave us at the last meeting ?

A. You did not give me the opportunity of stating all that I wanted to at that meeting ; I might have given you more information, had I been allowed. Therefore, I will now put in this statement as to the number of arrivals from the United States during the years named, and, if you will allow me, I would like to put in this statement of the number of days the salaried agents in the United States were in their offices, and the number they were travelling, during the fiscal year 1901-02. I have also a statement here of the names of applicants who applied for certain lands in the Saskatchewan district.

Q. That is companies ?

A. The individuals ?

Q. For large lots of land ?

A. Who applied to purchase these lands, certain lands in the Saskatchewan valley.

The following are the persons who applied to purchase 250,000 acres of government land on settlement conditions, namely :—A. B. Davidson, G. F. Piper, A. L. Warner, Geo. C. Howe, Donald H. McDonald, A. J. Adamson, W D. Douglas.

This is the statement showing the days on which the salaried agents were travelling from their headquarters, and the days in which they were at their headquarters.

Q. And does it give a statement of how many settlers each agent sent in ?

A. No, it does not.

Q. That was asked for.

A. Well, we have not a record of that.

Q. You remember, Mr. Chairman, when this matter was up,I called attention to the fact that it was no trouble apparently to get the number of immigrants sent in by commission agents, and I wanted to know how many were sent in by the salaried agents ; it seems to me that if you can get those that were sent in by the commission agents, you could get those who were sent in by the salaried agents. I think you ought to get that compiled.

A. I do not remember that being asked for at all ; I was questioned for a considerable time, on two or three days, on the point as to whether we should not be able to give the number of people these salaried agents had brought in, and I gave the statement that we could not possibly have that statement, as their work has been general. We have, however, a statement of the certificates issued by the salaried agents, as well as the commission agents upon which we can base a statement of that kind, although the basis is very incomplete.

Q. We ought to have a statement of what is being done by the salaried agents ; you say you can give it, to quite an extent anyway ?

A. Yes, to a certain extent, but I think it is hardly sufficient to be satisfactory.

These are all the reports that I have this morning, and I will get the other statement that has been asked for, as far as I can.

Statement of immigration from United States handed in by Mr. Smart, as follows :—

In considering the figures annexed hereto, it must be understood that in 1891 and previous years there was, without doubt, considerable overlapping, as mentioned in statement of 'Immigration Statistics per Department of Agriculture.'

IMMIGRANTS FROM UNITED STATES TO CANADA, FROM 1873 TO 1901-'2, INCLUSIVE.

1873	12,831
1874	17,908
1875	11,388
1876	14,335
1877	16,936
1878	18,003
1879	21,570
1880	18,419
1881	27,114
1882	62,315
1883	80,022
1884	61,494
1885	51,914
1886	38,505
1887	44,750
1888	44,360
1889	54,456
1890	45,985
1891	51,013
1892	Not compiled.
1893	"
1894	"
1895	"
1896	"
1897	"
1898	9,119
1899	11,945
1900 (first six months)	8,543
1900-01	17,987
1901-02	26,388

APPENDIX No. 2

COMMITTEE ROOM 34,
HOUSE OF COMMONS,
THURSDAY, June 11, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day, at 10 o'clock a.m., Mr. DOUGLAS, the Chairman, presiding.

Mr. JAMES A. SMART was present by request of the Committee, and was examined as follows:—

By Mr. Wilson :

Q. Before you go on with your statement, Mr. Smart, we have had the Barr colonists up two or three times, and, if I understood you rightly, you said that it has not cost the government anything to bring out these immigrants ?

A. As far as commissions are concerned.

Q. You pay nothing to Mr. Barr, nor to anybody else ?

A. No.

Q. What position does Mr. Preston occupy in the old country ?

A. He is the Commissioner of Immigration.

Q. What power has he ?

A. None to expend money without the authority of the Department.

Q. To whom were the entry fees of the Barr colonists paid ?

A. They were paid into the Commissioner's office by Mr. Barr, and by that office they were transferred to the head office here.

Q. To the Commissioner's Office ; is that Mr. Preston's office ?

A. Yes. I think Mr. Preston's accountant took charge of the money that was paid in.

Q. Have you any knowledge of what the steamship companies paid Mr. Barr?

A. I have not.

Q. I see Mr. Preston has an interview here, he has given an interview to the *Westminster Gazette,* in which he says that Mr. Barr will probably receive about 25 shillings per immigrant ; then he goes on to say——

A. I do not know whether that is the interview or not, but I noticed an interview with Mr. Preston with regard to Mr. Barr receiving some money from the government, or being compensated in some way by the government. I asked Mr. Preston for an explanation, and he denied having given any such interview at all.

Q. It appeared in the Montreal *Star* of the 6th as an interview taken from the *Westminster Gazette.*

A. I presume that is from their correspondent.

By Mr. Robinson (Elgin) :

Q. Was it not from the steamship company that he received the commission ?

A. No doubt, he got something from them.

By Mr. Wilson :

Q. And the government has no intention of paying Mr. Barr 7 shillings per head for these immigrants ?

A. Not that I know of. The matter of paying a bonus by the government to Mr. Barr was brought to my attention a number of times ; but I did not make any arrangement with him, and I do not think, under the circumstances, and in view of the results, that Mr. Barr's work entitles him to anything.

Q. Do you think Mr. Preston and the minister have not had an interview with regard to this ?

A. I am satisfied that he has not.

Q. Mr. Preston said the government had this colony in charge, independent entirely of all that Mr. Barr did.

A. Was he not referring to transportation there ?

Q. You can read it.

A. I think I have seen the same interview before. Mr. Preston says that he is wrongly reported in connection with that altogether. So far as having the Barr colony in hand, I may say that we always had supervision of these people since they arrived at Halifax, and conveyed them through to Saskatoon, seeing that they were properly provisioned, that they had a proper supply of tents ; we had stopping places for them, where we had tents erected, I think, 15 or 20 miles apart, so that we would know where these people put up. In addition to that, we had fuel and a supply of fodder for their horses.

By Mr. Robinson (Elgin) :

Q. How far would they have to travel after leaving the railway ?

A. About 150 miles altogether, from Saskatoon west.

By Mr. Wilson :

Q. Does Mr. Preston occupy the same position now that he did in 1901 ? He was then reported as Inspector of Agencies in Europe.

A. No, his position now is a little different from what it was in 1901. At the end of the year 1901, the Department took from the regular work of the High Commissioner everything pertaining to immigration, placing it directly under Mr. Preston's charge, subject, of course, to his consulting with the High Commissioner himself on any matters that he thought were of sufficient importance to consult him upon.

Q. His reports are still directed to the High Commissioner, are they not ?

A. I do not remember.

Q. My impression is that they are.

A. I cannot remember.

Q. I notice in his report for 1902 that it is 'Mr. W. T. R. Preston, Commissioner of Immigration for Great Britain and Europe.' Ireland is, apparently, left out of it.

A. I do not think that means anything.

Q. All you have to do is to send into the next room and get the report, and you will see it. I have understood that Mr. Devlin, when he was agent in Ireland, did not report to Mr. Preston.

A. Yes, I think he did ; he sent all his accounts through Mr. Preston, just the same as any other agent.

By Mr. Robinson (Elgin) :

Q. Mr. Devlin is not the agent in Ireland now ?

A. No.

By Mr. Wilson :

Q. Well, if you would say this is not correct, and the government is not going to do anything in the way of a bonus on the Barr colonists ?

A. I do not know what the government may do.

Q. But there is no understanding to that effect now ?

A. No understanding ?

Q. That is the effect of your evidence.

A. There is no understanding with him as to any bonus. In fact, we have been put to a considerable expense in consequence of the immigration of these people.

APPENDIX No. 2

Q. Will you send to the Committee a return of the number of people sent over by your agents in the States ?

A. I will send to the Committee the number sent by the agents.

Q. You remember that for the period from 1891 to 1901 the reports you have given heretofore have not given the number sent in from the United States, and I understand you are to do so ?

A. Mr. Boardman did not furnish me with any statement in regard to this—well, with part of it, not all. I think I have returned everything he furnished, from 1897 to 1901, perhaps.

By Mr. Clancy :

Q. I wish to ask you, Mr. Smart, if I understand you aright ; you pay the booking agents who are acting partly on our account and partly on account of the steamship companies, a certain sum, do you not ?

A. Yes, all the booking agents.

Q. All the booking agents ?

A. Yes, in Great Britain.

Q. Has that system proved to be satisfactory, on the whole ?

A. Well, I do not know that it has been unsatisfactory. We have had no difficulty in adjusting the accounts, and I do not know that there have been any complaints made.

Q. Could you say, of the whole number of persons who have come here from England——

A. We do not grant it on every one who comes from England. We only grant it on agriculturists.

Q. What number of those coming in are agriculturists, could you say offhand ?

A. The agriculturists, domestic servants, or men who are coming to Canada with the purpose of engaging as farm labourers, I think, number perhaps two-thirds.

Q. You think ?

A. I think so.

Q. Have you any means of knowing whether the booking agents are catching the persons that are sent out here through the efforts of your paid agents there ?

A. It does not make any difference ; they get the commission anyway, they get the commission on the tickets sold.

Q. Well, do they sell all the tickets ?

A. Yes, they sell all the tickets in Great Britain, with the exception of the Elder-Dempster line ; but of, course, they are out of business now. The agents, you understand, are the agents for the conference lines, the lines in the combination. The Elder-Dempster Company were not in the combination, and the agents were, therefore, not allowed to sell for them, but they are the agents for the conference lines.

Q. With that exception, they sell all the tickets to persons coming from England as immigrants ?

A. Yes.

Q. Still, the conclusion may be fairly arrived at that all persons coming within that class sent by our agents they are paid for ?

A. Yes, $1.75 for full tickets, and half that amount for half tickets.

Q. Well, it would be difficult in this case to determine whether we owed any success to the booking agents or our own agents ?

A. Well, the booking agents represent lines running to every country, and the system is an old one, and it has not been to our advantage to withdraw it. I do not think any booking agents do anything for us but sell tickets.

Q. But why should we pay for this twice, first to our own agent and then the booking agents ?

A. Simply to have the good-will of the booking agents. These agents might very well turn the man away from us by a remark. On that account, and it having been in effect so long, it would not be well to stop it. It is only a small amount, anyway.

Q. It is simply for good-will ?

A. Yes, except in the case of local agents. We have in the larger towns local agents. They take a special interest in Canadian immigration. They advertise Canada, put our literature to the front, and do what they can to encourage immigration to Canada. These people we give an additional 5 shillings to, making 12 shillings in all, or $3.

By Mr. Wilson :

Q. Only that ?

A. Five shillings additional we add on each ticket to our local agent. We find this to work very satisfactorily indeed, and it has been in operation about a year. It is a good plan. I was in one or two towns myself to see what class of people were acting for us and how they were doing business. I found they were taking a great interest in the work, and you could not see anything over their office walls and windows but "*Canada,*" showing that they are taking a great interest in encouraging the rush to this country.

By Mr. Clancy :

Q. Is there any connection between these agents and the local agents ?

A. They are appointed by the salaried agents. Each salaried agent has a certain district, and if within that he can find a suitable person or firm—not necessarily booking agents—whom he thinks can act satisfactorily for this country, he appoints them, subject, of course, to the London office.

Q. Of course, he hands over all the people he gets to that agent for their tickets ?

A. Well, I do not know.

Q. Well, if he becomes his own agent, he is likely to do that.

A. We find it works well, and our experience this year shows that it does well to have these agents in the larger towns.

Q. Has there not been an abnormal movement this year ?

A. I think it is largely due to that and the general advertising we have done in the last few years, and the Coronation Arch, as well as the efforts put forth by the steamship agents, and the Canadian Pacific as well, I must say. They publish pamphlets setting forth the advantage of travelling by their line, of course, but I think all these things help.

Q. Have you any record from our agents in Europe ?

A. On the Continent ?

Q. Yes.

A. We have only one agent that does business on the Continent, a syndicate of steamship agents, with headquarters at Antwerp. They do all the work, do all the advertising, have to do so much advertising and show vouchers to prove it, and they are paid a commission on the agricultural immigrants that come from certain countries in Europe.

Q. Who is the judge as to which class they are ?

A. As to whether they are agriculturists ?

Q. Yes.

A. We take the record of that ?

Q. From whom ?

A. From the people themselves.

Q. When they come ?

A. When they land.

Q. Here ?

A. Yes. And then we get a statement from the company as well, in their demand for commission, and we compare that with our own records.

APPENDIX No. 2

By Mr. Wilson :

Q. That is the evidence upon which you pay the commission ?

A. Yes.

Q. That is those that land here ?

A. Yes.

Q. And have they a record of the agent that sent them ?

A. No, that is not necessary. We give it to them on agricultural immigrants from certain countries, so there is no other check necessary, it seems to me, from the continent of Europe.

Q. Whom have you now acting for you in Dublin ?

A. Mr. Webster.

Q. Has he been appointed regularly ?

A. No, he was formerly with Mr. Devlin in Dublin.

Q. Was he the man who was sent to England, and now you have taken him back ?

A. Yes.

Q. Is he permanently appointed ?

A. No.

Q. Do your furnish houses in the Old Country for your agents?

A. No.

Q. Did you furnish one for Mr. Preston ?

A. No.

Q. Did you furnish one for Mr. Devlin ?

A. I think there was one ; I am not sure.

Q. Yes. Here is an item showing that you paid $350.40, rent of house, Rathdown Terrace, 12 m. Can you give any information about that ?

A. I cannot tell you that.

Q. That is something we ought to know, whether one agent should be selected and given a home to live in, while the man who is over him should have to pay his own rent, both getting the same salary. It seems a little strange, does it not ?

A. I cannot express any opinion on that at all ; I did not make any arrangement myself with him.

Q. Can you get the information why that was done ? We should like to have it.

A. No, I think it will be well to ask the minister about that.

Q. You think it will be well to ask for it in the House ?

A. I think so.

Q. Here is another matter that seems a little strange : the Ottawa *Free Press,* four years, $41.04 ; how do you explain that ?

A. That is a subscription for the Ottawa *Free Press* for the time named, with postage.

Q. Yes, but does it cost that much for it ?

A. Yes. The postage amounts to a large sum, larger than the paper itself, the same as in the case of any other paper sent to the old country ; the *Globe* or *Mail* costs probably $12 or $15 a year with the postage.

Q. What does he pay for the *Free Press* itself ?

A. I think the *Free Press* here is $5 or $6 a year.

Q. I think it is only $3 or $4 ; you can get the *Citizen* for that much, and the Toronto *Star* for $1.50.

A. I cannot say ; I do not keep track of that.

Q. I see that by the reports you put in you paid 3 cents apiece for them, when you took a lot of them ; you say that the statement you put in here is for both advertising and papers, so that it is utterly impossible, unless we took the accounts in the Public Accounts Committee, to see what you did pay ; it mixes the report up this way in that regard. For instance, you give us the Toronto *Globe ;* you got 1,000 of them, I think, if I remember aright, and you put advertising in with them—yes, Toronto *Globe,* 1,000 copies Christmas number—but here is advertising in here, too ?

A. Both were included in the same arrangement. We arranged with them to insert an advertisement in the Christmas number of the Toronto *Globe* at so much money, and we said we would want 1,000 copies of the paper.

Q. Was that more like a magazine ?

A. Yes, it is a very large paper.

Q. What was there in it besides your advertisement that would be particularly interesting to immigrants ?

A. I do not know. It was a publication which, it seems to me, reflects some credit on the country, and we were able to send them abroad.

Q. But 1,000 of them would not amount to anything ?

A. Of course, we could not make a general distribution under such terms.

Q. I think you paid 35 cents apiece for them, and took a thousand ; did you buy them direct from the *Globe* or from the Canadian News Company ?

A. We bought directly from the *Globe*.

Q. You could have bought them just as cheaply from the News Company, I am told. Here is the Toronto *Star ;* all they ask in a circular is $1.50.

A. For what ?

Q. For the Toronto *Star*. You have it here in this memorandum, I think.

A. I suppose we paid the same price. I do not know. I do not see why they should charge us more than they did others.

By Mr. Clancy :

Q. Were you able to get for the Committee the additional information Mr. Wilson asked for in connection with this statement you put in yesterday ?

A. No, I have not, yet. You see, it is quite an undertaking to work out that information ; it will take a few days to do it.

By Mr. Wilson :

Q. He has agreed to send it to the Committee, and a copy to me.

A. Yes, I will send a copy to Mr. Wilson and to the Committee.

By Mr. Clancy :

Q. It will only delay Mr. Smart concluding his examination, because when that information is put in, the Committee may like to have some further information than is disclosed in it.

A. Well, I will be very glad to come any time the Committee orders it.

Q. Will you be able to take that up at the next meeting ?

A. I presume so.

By the Chairman :

Q. We have agreed to hear Mr. Saunders to-morrow.

A. I would not have that statement ready before next week at any rate, but I will push it through as fast as possible.

By Mr. Clancy :

Q. I suppose we can defer it, with the understanding that it will be taken up at the first meeting next week ?

A. I will be prepared, I think, then. It will be about Tuesday or Wednesday, I suppose ?

The CHAIRMAN.—On Wednesday, probably.

APPENDIX No. 2

By Mr. Ross (Ontario) :

Q. Can we not finish this morning ?
A. I think I can.

SPECIAL WORK.—I want to refer particularly to-day, although we have discussed portions of it, to the work we have been doing in the British Islands. As I informed the Committee a year ago, the Department was endeavouring to secure premises then, and we had at that time a particular place in view, which we were able to secure within a few months afterwards. The lessee of the ground, who was putting up a large new building, came to the officers of our Department in the old country and offered what has proved to me perhaps the most valuable location in the city. I do not know that there is any better location which could have been secured in London for our purposes. It is a new building, just completed, at 11-12 Charing Cross, immediately in front of Trafalgar Square, which, as those of the Committee who have been in London know, is now recognized as the centre of the great city. In this building we have secured what is equal to almost two stores on the front floor, a splendid basement, the front part of which we are using, and which is pretty well lighted without artificial lights in the daytime. The front part we are using for an exhibition hall, where we propose to have a good exhibit of Canadian products. It is very convenient to get at, even the basement, and the rear part of the basement will be used for sending out large quantities of literature, for which it is well adapted.

By Mr. Stephens :

Q. What kind of products do you exhibit ?
A. Farm products.
Q. Entirely ?
A. We will probably have some minerals, if we can get a good exhibit ?

By Mr. Robinson (Elgin) :

Q. You replenish the agricultural exhibits ?
A. Yes, from time to time.

We have, in addition to that, two splendid rooms up-stairs, one of which will be used for typewriters, and the other we intend to use as a reading and writing-room for Canadians who happen to drop into the office, and it will be a very comfortable place for them to rest and write letters and also to read Canadian papers, which we will have on file in that particular room. I may say, that in order to make it as thoroughly Canadian as possible, we have arranged, even in the heating appliances, to put in a Canadian boiler, Canadian fittings, and have finished the offices in Canadian woods, and I may say, that on the whole it presents a very attractive appearance indeed.

Q. For how long have you got the lease ?

A. We have the lease for twenty-one years, terminable by the tenant at the end of the seventh or fourteenth year.

By Mr. Wilson :

Q. Did you state what you pay for it ?
A. We pay £1,200 sterling a year for it, about $6,000.
Q. How does that compare with the rents in the locality ?
A. I think it is very reasonable.

By Mr. Ross (Ontario):

Q. That would seem to be very reasonable for that locality ?

A. It was the very best arrangement we could make. I think the rate is a little less than that for which we were first offered the premises.

By Mr. Robinson (Elgin) :

Q. It is one of the best locations in the city of London ?

A. It would not have been possible for us to have secured, anywhere else in London, as good a location as we have got.

By Mr. Wilson :

Q. How far is it from the High Commissioner's office ?

A. A mile.

By Mr. Ross (Ontario):

Q. It is practically the centre of the city, near the British Museum, the National Art Gallery, the Wellington Monument, and so on, and all of the busses start from there.

A. A large number of busses which go down Whitehall, going over Westminster Bridge, and also along Victoria Street, all stop in front there to take on passengers.

By Mr. Robinson (Elgin) :

Q. It is the beginning of the Strand ?

A. Practically the beginning of the Strand. We think, altogether, with the conveniences we have now, we will be able to do far more effective work, and that people will be able to find the Government offices much more easily than they could where they were formerly located.

By Mr. Ross (Ontario):

Q. They could not miss them ?

A. No.

Q. For how long is the lease ?

A. For twenty-one years, terminable at the end of seven or fourteen years. I think it is a very favourable lease and the best possible situation. We intend to have a large illuminated sign across the front, so that even at night people will know where we are.

The only changes we have made of special importance in the old country this year was the establishment of an agency at Birmingham. Formerly, we had two agents at Liverpool, and now we have divided this staff, leaving one at Liverpool and creating a new office for Birmingham and the districts surrounding that city. That is found to work very satisfactorily indeed, and we look for the very best results from it.

By Mr. Robinson (Elgin) :

Q. Mr. Jury is still in Liverpool ?

A. Mr. Jury is still in Liverpool, and Mr. Mitchell is in Birmingham.

Regarding our work there, as I have already intimated, there are a number of things that have helped to bring about the results we see this year, which of course are very gratifying to every person, as I expect that this year, certainly by the end of the calendar year, we will have perhaps 45,000 to 50,000 British settlers, which is nearly four times as many as we have had for a number of years up to two or three years ago.

By Mr. Wilson :

Q. Are you speaking of the fiscal or the calendar year ?

A. I am speaking of the calendar year as to the 50,000.

Q. From Great Britain and Ireland ?

A. We will certainly have over 40,000 for the fiscal year.

Coronation Arch.—There are a number of things that have contributed to this

result, and I want to say, that not the least was the fact that last year, during the Coronation, we erected what is known as the Coronation Arch. There is nothing that attracted more attention, I think, at the Coronation, except the King and Queen, than the arch. It was talked about, it was photographed, and a cut of it appeared in every newspaper, not only in England, but throughout the Continent as well, and I think that while it was looked upon as a very patriotic thing for us to do, that the results from it, as an advertising medium, from our standpoint, were very great indeed.

By Mr. Robinson (Elgin) :

Q. You decorated it with grain ?
A. We had it all decorated with wheat ?

By Mr. Wilson :

Q. Was it your Department that got that picture of it, down in the hall ?
A. Yes.
Q. Do you know what it cost ?
A. I did know what it cost, but I have forgotten. It was not very expensive.
Q. It is a very beautiful thing ?
A. Yes.

By Mr. Ross (Ontario) :

Q. Did the King pass under this arch on his way to the Coronation ?
A. He had to. It was right in the line of procession, the main thoroughfare to Westminster Abbey and near the Parliament Buildings.

By Mr. Robinson (Elgin):

Q. It was left standing until the Coronation actually took place ?
A. Yes. We had to renew it from time to time. In the first place we had it ready for June, and we had it decorated with wheat, and we had 'Britain's' granary' printed across the front of it. The next occurrence of interest to the old country people was Kitchener's return from South Africa, and we decorated it again to suit that occasion with some motto on it, I forget just what the wording was.

By Mr. Ross (Ontario):

Q. From what section of Canada did the wheat come ?
A. From the North-west.
Q. Was there none from Manitoba ?
A. From Manitoba and the North-west Territories.
Q. No. 1 hard?
A. Yes.

By Mr. Wilson :

Q. What was the cost of the arch, do you remember ?
A. About $33,000 altogether with the different decorations. In connection with this too Mr. Preston took every advantage of it, and it was a means of advertising Canada far and near. I think that I presented to the Committee the special work that we undertook during my visit to England, in the winter of 1902. It appeared to create a very great interest amongst the people so far as Canada was concerned. We made up our mind to get at every farmer or farm labourer in England by a publication we prepared and had published while I was on the other side. We have done the same thing this year. We published an edition of what we call *Western Canada* and we sent this paper to every farmer and farm labourer.

Q. That is a repetition of what you did last year ?

A. Practically a repetition of what we did last year through the whole United Kingdom, and the result has been an enormous correspondence with the various offices in the old country, and in addition to that we prepared, or we had Lord Strathcona prepare, a letter which he was good enough to sign and which was addressed to clergymen throughout the country and to public institutions; and to each of these we sent one of our papers, together with one of the circular letters, which I have brought so that you can see what His Lordship had to say.

Q. You might read it.

A. *Western Canada* is a very good publication. You see we had Lord Strathcona's picture in the front of it.

Q. Is the letter published in the paper ?

A. No, the letter is separate. I have it here, and if you like I will read the letter, which is as follows :—

'My Dear Sir,—About a year ago I ventured to address you a letter having reference to the question of emigration to Canada, with the view of enlisting your sympathies in the settlement of the vast fertile lands of the Dominion with people of British origin.

'In the interval, the particular portion of the Dominion to which the attention of the people of the United Kingdom is now being specially directed has made exceptional progress, upwards of eighty thousand persons having arrived from other countries and established new homes in the Canadian North-west.

'In this connection, it is a source of satisfaction to know that the movement from the United Kingdom has shown a considerable expansion. Permit me, however, to say, that while this is the case, yet I am not at all satisfied—a feeling which the Canadian government shares—that the number of British immigrants is as large as the conditions and prosperity of the country and the opportunities that are offered to settlers would fairly entitle us to expect. While not desiring to take up your time by a lengthy statement, I trust that your smpathy and influence may again be exerted in so far as you may feel justified in doing so (in regard to any persons who may contemplate emigration and may confer with you on the subject), in making better understood and appreciated the advantages of Canada's greatest and nearest possession.

'The results of the harvest in Manitoba and the North-west Territories for the year 1902, since I had the pleasure of communicating with you, have fully justified everything that has been said in favour of Canada as a field for the settlement of people from the British Isles.

'I take the opportunity o fwriting to again summarize a number of the advantages which, amongst others, Canada offers :

'1. A free grant by the government of 160 acres of land to every male settler of eighteen years and over.

'2. A healthy climate.

'3. A country where law and order are most strictly observed and enforced.

'4. A system of education, and educational institutions, equal to those of any other country.

'5. Churches of various denominations, which are established, even in the new districts, as rapidly as the country settles.

'6. Excellent transportation facilities for carrying to market the products of the farm.

'7. Good local markets and fair prices for products.

'8. The fullest recognition of civil and religious liberty.

'To those who have an aptitude or liking for agricultural pursuits, who are willing to work and to exercise reasonable economy, especially during the first few years, farming is undoubtedly more to be relied upon as an industry in Canada, than in any other country in the world.

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'In addition to the other advantages offered to settlers from the United Kingdom, the fact must appeal to them that Canada is British territory, and that those who make their homes in the Dominion maintain their birthright in every sense of the term.

'In conclusion, let me say that the Canadian government feels that it can, in view of all the circumstances, appeal with confidence to the emigrating population of Great Britain—there are something like 100,000 leaving the United Kingdom annually—and ask them to remember the inducements which Canada offers to them—superior perhaps from many points of view to those in any of the new countries to which emigration is now being invited.

'I, therefore, beg to suggest that your influence may be used on behalf of Canada, whose doors are open to the people of the mother country. British settlers may, if properly advised and directed, have a share in providing themselves and their families with happy and comfortable homes and profitable employment, and in builidng up the British Empire, of which the Dominion is proud to form a part.

'Believe me, yours faithfully,

'STRATHCONA,

'High Commissioner for Canada.'

Q. Very good.

A. This was sent, as I have said, to ministers, 120,000 altogether; to Young Men's Christian Associations; to all those persons to whom we though would-be settlers would naturally turn for advice, and the idea was to post them properly.

By Mr. Robinson (Elgin):

Q. I notice some English local papers published that.

A. Yes, and I heard over there that one minister read it from the pulpit.

By Mr. Wilson :

Q. Did you have to pay for putting it in those papers Mr. Robinson mentions ?

A. No.

Q. You had to pay for the printing of this *Western Canada ?*

A. Yes.

Q. You got a large lot of them ?

A. 600,000.

Q. How much did you pay?

No answer.

By Mr. Ross (Ontario) :

Q. I suppose most of the papers are glad to publish anything about Canada ?

A. Yes, facts.

Q. It is Canadian news they are looking for ?

A. Yes. There is no question at all as to the tremendous interest that exists to-day in the old country as regards Canada. All eyes are turned to us. We thought we were going to have a strong competitor in South Africa, but that country is not now looked upon as such.

By Mr. Wilson :

Q. It is played out as a field for emigration ?

A. The reports that came from there were not encouraging, and we have now no competitors among the British colonies.

CIRCULATION OF SCHOOL LITERATURE, ON CANADA.

By Mr. Blain :

Q. You have circulated some literature in the old country schools ?

A. Yes. I was going to say that a year or two ago we undertook to provide the schools in the old country with certain books, and also offered, through the High Commissioner, a medal to the child passing the most proficient examination in regard to Canada, its resources and geography.

By Mr. Wilson :

Q. Are you still doing that ?

A. No. We continued for two years and then dropped it. We find it is not well to do the same thing two years running ; it is well to change, and we are continually using our heads to work out some new scheme which will attract attention. There is no doubt about the good that scheme did. What we did was, first to offer a medal and furnish certain books, as well as copy books with head lines as to the advantages Canada offers and her resources. Then we distributed atlases to give them some idea of Western Canada particularly and the geography. We thought that if we created interest among the children, we would be sure to ultimately reach the parents, and by offering prizes for competition it would the more assist in that way. So I think a large share of the success of our work in the old country last year was attributable to that work among the children in the schools.

Q. Educating them regarding Canada ?

CANADIAN FARMER DELEGATES TO GREAT BRITAIN.

A. Educating them regarding Canada. Now while we have adopted all these plans, I think we have struck this year, in conjunction with what we have done formerly, the best thing we ever undertook as far as respects Manitoba and the North-west. The people were pretty well waked up to the fact that Canada is an attractive country to which to emigrate, and attention has been pretty well attracted to this country. We devised the idea of sending across farmer delegates, successful western farmers, many of them old country men, to the old country, simply for the purpose of giving their personal testimony and experience as to Canada. We sent over in all about 55. They were distributed among our various agencies, and programmes were prepared as to the points they would visit and where they could be seen. While we have no report yet, we will perhaps have one ready for this year's report, showing what they did, what places they visited and the number of people with whom they discussed their own experiences in this country.

By Mr. Ross (Ontario):

Q. Did they hold public meetings ?

A. In many places.

Q. Were they well attended ?

A. Yes. I took a quiet opportunity to see how these meetings were conducted by going to one unknown to the man himself to see the audience and how he conducted himself, and I found it was a great success.

By Mr. Robinson (Elgin):

Q. What county was that in ?

A. Warwickshire.

Q. Are these North-west farmers ?

A. They are Manitoba and North-west farmers, men who had from twelve to twenty years' experience in the country, and who had been successful. This man I

heard speak on this occasion was a fairly good speaker and received a very good reception indeed ; the place was packed, and the people could not get in, although there was a charge made for admission. I think they sold reserved seats for 6d. and seats in the gallery for 1d. I took a penny seat myself.

By Mr. Wilson :

Q. Do you think that adds to the number of people that come out, because there was a little fee charged at the door ?

A. I do not know ; the trouble was, there were so many people that were really interested in hearing about Canada, that they were willing to pay.

Q. Mr. Preston told us there was a difficulty in getting people out to the meetings.

A. There is no difficulty there now. There is such a tremendous interest in everything relating to Canada that one who has not been there can hardly understand how it has been created ; I do not think it is possible for any other country to attract the attention that Canada is attracting there to-day.

By Mr. Robinson (Elgin) :

Q. It is our great wheat crops, I suppose ?

A. It is probably the good reports that have gone back there.

By Mr. Gould :

Q. I think it is the good management of the departmenut in advertising it.

A. I think there is no doubt about that. Now, we sent over—I have the list of names, if the Committee wishes to have it, and I may say that the farmer delegates——

By Mr. Ross (Ontario) :

Q. What was the effect of that meeting ?

A. I was going to recite to you a little of the speech I heard. The gentleman, in making his speech, apparently told the story of his own experience. I do not know how successful he had been myself, but learned a good deal at the meeting. Among other things, he told the audience that he had gone to the country with about $20, that is, about £4. He converted his money into old country money, although he is a Canadian, and he told them how he had worked himself in order to earn sufficient money to buy some stock to start with, and had worked along year after year in that way, until he had secured what he has to-day, namely, I think he said he owned something like 900 acres of land, and of that, 400 or 500 acres were under crop. He told the audience how he sowed and how he reaped, and gave them all the details in connection with the raising of the grain from seeding until he sold it. He said he had two sons, and he told how one son, who had retired from business altogether, had 1,500 or 1,600 acres of land, and sold out his land and had retired, whether it was on account of ill-health or for some other reason ; he also told of another son who had something like 1,200 acres of land, and of the enormous area he had under cultivation ; and that he had two or three daughters, and wound up by telling him that, as far as the younger daughter was concerned, she is now attending boarding school, the others are married. So that I think he really told a story that was very, very good, and there was no question about it that his remarks were particularly well received. I heard the address of another man at the same meeting, one of the agents. I will not mention his name, but I consider that the speech of the farmer was worth a dozen such speeches as the agent's, because he told what was his own actual experience ; his address was short and to the point, and he presented his facts well.

Now, these men all had their own localities, wherever they could do the best work, and wherever their services were needed, they remained two or three weeks, and where there was not much demand, they remained a day or two. These arrangements were all advertised ahead, so that they had the opportunity of meeting the people ; and

these advertisements set out the name of the gentleman, where he came from, and that he was a successful farmer from Canada and was there for the purpose of giving his own experience as a farmer living in this country to the people who desired to obtain the information. Certainly, I am convinced that nothing we have done could have clinched the work as well as sending these men there to give their own personal testimony, and although I do not perhaps give them all the credit for the large number that have come—a good many of them, I believe, are taking a good share of it to themselves—I believe they did very effectual work, and that it was well worth the effort, and not only is that the opinion of the department itself now, but the opinion of people in the old country ; everybody commended it, and the newspapers thought it was one of the most successful forward movements they had ever heard of in connection with immigration work.

By Mr. LaRivière :

Q. Was not the same experiment made some years ago ?

A. No, never that I heard of.

Q. Not that we returned men who had come from the old country ?

A. That is a different thing altogether, these were not sent there as returned men. The men sent over years ago, a few, not more than half a dozen at a time in any one year, were sent over to bring out people, they were sent to new localities where they thought they could get people and bring them out; we did not ask these men to bring out people.

By Mr. Wilson :

Q. You may say that your experience is becoming more valuable every year.

A. We are not wasting our time, we are trying to improve year after year. We paid all the expenses of these farmers whilst they were over there and allowed them a certain amount for extraordinary expenditure.

Q. You did not select them according to their political experience ?

A. I did not select them myself.

By the Chairman :

Q. From my constituency I am glad to say that both parties were fairly represented; we sent good men.

A. If you desire it, I will give you extracts from the papers showing the value of these men's services.

By Mr. LaRivière :

Q. I do not know that there would be any objection to handing them to the reporter.

By Mr. Ross (Ontario):

Q. Put in extracts from a dozen of the leading papers.

A. I will be glad to have some extracts made. There were 55 men you know in the delegation, a rather large number.

By Mr. Wilson :

Q. Perhaps it will be better to put in one from each man, then you will be able to select the best men for next year.

By Mr. Ross (Ontario) :

Q. Put in opinions from different parts of the country, England, Ireland, Scotland and Wales; were they in all parts of the country ?

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A. They were all over and in Wales as well.

PERCENTAGE OF IMMIGRANTS IN 1902 FROM SPECIFIC DIVISIONS.

MR. SMART:—A year ago I thought it would be a very good thing to ascertain as nearly as possible from what parts of the Old Country these people came; we never seemed to have any record whatever as to the particular districts from which the settlers who came over and settled in the west came. With that object in view, I gave instructions that the agents should ascertain from every person arriving from the Old Country, the county from which he came; the idea was that we would know then definitely where we could do our best work or where we would be likely to do our best work. I have this statement here prepared and I have tabulated it and it is, I think, really something of interest to know where these people came from. I have the same thing from Ireland too.

By Mr. Blain :

Q. Might I ask if these 55 farmers purpose giving a report to the government of their trip ?

A. Yes, each one has been instructed to make a report, and nearly all have sent in their report already.

By Mr. Wilson :

Q. You will publish them in your annual report ?

A. I think we will summarize them.

Q. When will it be ready ?

A. We are at work on it now and it will be ready at the end of June.

By Mr. Ross (Ontario):

Q. Have you a man named White in your department ?

A. Yes.

Q. Why I speak of it is that a man named White had been placing girls and boys in our county, Ontario. Within a short time he has brought in 27 children, girls from 8 to 10, and they were placed around with people in our locality.

A. No, he is not in the employ of the Dominion government.

Q. It must be the Ontario government ?

A. Not ours. I have this statement I mentioned, which I may say is not complete, but it is sufficiently so to give a fair indication of where these people come from. It is impossible to get everybody, and just at present I think the agents are having a very difficult time getting this information as well as other information we would like to have. Between 3,000 and 3,500 people landed at Quebec within eighteen hours last Friday and Saturday, so you see it is a great deal of work to get out all this information from the people, or even from the heads of families.

By Mr. Ross (Ontario) :

Q. Could not an agent be put on the ship during the voyage to take all that information that you desire ?

A. Yes, and we have had that under consideration already, to have a representative of the department on all these ships carrying a large number of people.

Q. Even if you went on board at Father Point, it would be a help ?

A. That is under consideration as well.

By Mr. Stephens :

Q. What is the object of having this information taken ?

A. So as to know where we do our most effective work. We found that London and Middlesex return the largest number.

By Mr. Ross (Ontario) :

Q. Naturally so.

A. Twenty-eight per cent of our immigration from England comes from the county of Middlesex, with the city of London ; Lancashire, eighteen per cent ; Yorkshire, eight per cent.

By Mr. Wilson :

Q. You have the number as well as the percentage ?

Y. Yes, but there are only a proportion, it does not give the full number.

Q. I should think that you would have carried it out ?

A. We could not get the information.

Q. How could you get the percentage ?

A. I am taking what we have got and assuming that it is a fair percentage of the whole. That is the only possible way.

Q. Making an average ?

A. You could not do it in any other way. Yorkshire, eight per cent ; Kent, four per cent ; Essex and Surrey, three per cent each ; London, two per cent. The balance are under two per cent.

It would appear, therefore, that Lancashire and Yorkshire returned about twenty-five and a half per cent of the people coming from England to Canada, the other four districts, Middlesex, Surrey, London, Essex and Kent sending thirty-seven and a half per cent. So that the majority come from the north and the south-east portions of England.

By Mr. Ross (Ontario) :

Q. You have hardly touched the west coast ?

A. We have hardly touched it.

By Mr. Robinson :

Q. Are there any from the Midland counties ?

A. Yes, but the numbers are very, very small. We have also the figures from Scotland.

By Mr. Ross (Ontario):

Q. They will come mostly from Glasgow ?

A. Yes, Lanark, of which I think Glasgow is the county town, shows twenty-five per cent ; Aberdeen, eleven per cent ; Edinboro' Fifeshire, Renfrew, seven per cent each ; Ayrshire, six per cent ; Forfarshire, five and a half per cent ; Stirling, three and a half per cent ; Perth, three and a half per cent ; Inverness, two and a half per cent ; Orkney, two and a half per cent. All the rest are much smaller than that.

By Mr. Wilson :

Q. What is the highest percentage from any of the districts ?

A. From Middlesex.

Q. What is the percentage ?

A. Twenty-eight per cent. Now in Ireland we find the province of Ulster is the best field for our work. The returns from Ireland show : Ulster, sixty-one and a half per cent ; Leinster, twenty and a half per cent ; Munster, twelve per cent ; Connaught, six per cent.

Some counties return very small numbers and some hardly any at all. In fact, I think that from some counties in Ireland we never got a single settler last year.

By Mr. Ross (Ontario):

Q. These Irish people would sail from where ?

A. Liverpool, Londonderry and Moville, most of them.

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IMMIGRANTS TO CANADA IN 1902; FROM THE UNITED KINGDOM, BY COUNTIES.

Q. Better put in the figures as you have them ?
A. They are complete, as I say, and are as follows:—

England:—

Bedford	86
Berks	88
Bucks	50
Cambridge	51
Chester	185
Cornwall	80
Cumberland	104
Derby	107
Devon	207
Dorset	80
Durham	191
Essex	300
Gloucester	146
Hants	180
Hereford	77
Hertford	47
Huntingdon	17
Kent	376
Lancaster	1,781
Leicester	101
Lincoln	168
London	2,054
Middlesex	772
Monmouth	34
Norfolk	106
Northampton	56
Northumberland	106
Nottingham	124
Oxford	62
Rutland	5
Salop	76
Somerset	175
Stafford	217
Suffolk	94
Surrey	301
Sussex	138
Warwick	229
Westmoreland	42
Wilts	72
Worcester	121
York	777
Channel Islands	48
Isle of Man	15
Outside British Islands	62
Isle of Wight	9
Not given	3,139
	13,266

Wales:—

Anglesea	
Brecon	4
Cardigan	10
Carmarthen	6
Carnarvon	8
Denbigh	14
Flint	9
Glamorgan	75
Merioneth	
Montgomery	3
Pembroke	6
Radnor	1
	136
Patagonia	199
Not given	99
	434

Scotland:—

Aberdeen	258
Argyle	32
Ayr	140
Banff	35
Berwick	9
Bute	2
Caithness	21
Clackmannan	11
Dundee	
Dumbarton	30
Dumfries	39
Edinburgh	166
Elgin	11
Moray	29
Fife	161
Forfar	128
Glasgow	28
Haddington	8
Inverness	67
Kincardine	27
Kinross	5
Kirkcudbright	24
Lanark	584
Linlithgow	21
Nairn	4
Orkney	54
Peebles	4
Perth	86
Renfrew	163
Ross	34
Cromarty	3
Roxburgh	21
Selkirk	13

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Shetland	13
Stirling	79
Sutherland	7
Wigtown	29
Outside	2
Not given	885
	3,233

Ireland:—

Antrim	217
Armagh	78
Carlow	2
Cavan	28
Clare	10
Cork	42
Derry	62
Donegal	33
Down	113
Dublin	103
Fermanagh	20
Galway	21
Kerry	11
Kildare	6
Kilkenny	26
Kings	
Leitrim	12
Limerick	27
Longford	7
Louth	5
Mayo	9
Meath	5
Monaghan	22
Queens	28
Roscommon	3
Sligo	16
Tipperary	25
Tyrone	44
Waterford	8
Westmeath	
Wexford	12
Wicklow	13
Not given	325
	1,333

The great cry in the Old Country amongst the people who want to emigrate is that they have not the money. I am perfectly satisfied that, large as the immigration is from the Old Country this year, we could have four or five or six times as many if we offered any inducements to them to come, in the way of assisted passages, but all agree that the policy of the government respecting that is a good one, that nothing in the shape of advances on transportation should be made. There may be cases where it would be a benefit.

By Mr. Robinson (Elgin) :

Q. You think you get a better class of people ?

A. I think a better class of people will come.

By Mr. LaRivière :

Q. It is not always the best class of people who have the money ?

A. Not always.

Q. Has it been your experience that the most successful people in the west are men who came in there almost paupers ?

A. Yes.

Q. Those that had money as a general rule did not succeed and went back and decried in the country ?

A. In many cases that is true. I am satisfied that three-fourths of the most successful people we have got in Manitoba and the North-west Territories are men who had practically nothing more than money enough to pay their fare to the country when they came here.

By Mr. Ross (Ontario) :

Q. That is the history of old Ontario. You could pick out hundreds that had not a nickel.

A. Just the same. I must say I have not fallen in with the idea that only those who have had agricultural experience are the kind of settlers we want, because I think the history of Canada itself throughout and of Ontario particularly shows that the people who came here and settled this country originally were not farmers, but were men who were willing to work and exercise a little thrift and economy in the management of their farms, and they succeeded in the long run, and the same thing will apply to Manitoba and the North-west Territories.

By Mr. LaRivière :

Q. I made that statement on account of a remark by Mr. Robinson, who said that by not assisting emigrants you get a better class ?

A. That is not always true.

By Mr. Heyd :

Q. I suppose one of the best evidences a man can give of want of thrift is having arrived at middle life without having money enough to get to this country ?

A. I suppose it is. There has been a great deal of talk in the Old Country about the unemployed there. While I was there this winter, they had demonstrations in connection with the unemployed, and public meetings, and the whole trend of opinion seemed to be, 'If we could only send these people to Canada.' I have no doubt a large number of good people could be selected from them, but the difficulty is they have not money enough to pay for the transportation.

By Mr. Wilson :

Q. I think your agents recommended two years ago that some assistance should be given, and even Lord Strathcona did so. I was very glad the minister stood out against that ?

A. His idea and that of his agents was that they would select the people, find out their history, and make a selectioin of a desirable class, and that in that way we could get good settlers ; and no doubt that could be done, but the difficulty is it would open the door to bringing in a lot of undesirable people.

APPENDIX No. 2

By Mr. Stephens :

Q. Could not the English government be induced to aid these people in some way ?
A. That they have absolutely refused.

By Mr. Robinson (Elgin) :

Q. Lord Strathcona might do something to aid in sending discharged ship soldiers to Canada. He did a magnificent work in sending a body of troops to South Africa.

A. This very thing came up in the British House of Commons, while I was on the other side, in connection with the reservists of the British Army. Mr. Marshall Hall asked the Secretary of State for War, ' Whether he will consider the advisability of giving to army reservists and discharged soldiers who have fought in the late South African war some pecuniary assistance to enable such of them as may so desire to emigrate to Canada, or some other colony willing to receive them.'

To this Mr. Secretary Brodrick answered : 'I fear that this object, however, desirable in itself, is not one to which army funds could properly be devoted.'

Thus the matter is one that has been brought to the attention of the British government on a number of occasions.

By Mr. Wilson :

Q. Was not some one authorized to offer ten dollars apiece to assist the passages of these people ? On what ground was that done ?

A. I cannot say.

Q. The Minister was opposed to that in the House?

A. It was thought it would be a popular move and attract attention too, that the government was willing to aid, so far as these soldiers were concerned, men who had served in the army, and who should be selected to be sent to Canada ; that it would be an advantage to us and an advantage to our work generally to show encouragement Canada was willing to give. I do not know that anything has been done with regard to it.

If there are no other questions the Committee would like me to answer with regard to the old country, I am practically through. So far as the continent is concerned, it is in exactly the same position as a year ago. The work is being carried on on the same lines, except, of course, that they are losing a large number of settlers now on account of the strict medical examination which we enforce.

Q. That is all the better.

By Mr. Blain :

Q. How does the population of the provinces of British Columbia, the North-west Territories and Manitoba, at the present time, compare with the large number of immigrants who have gone in there in the last six years ?

A. How does it compare, in what way ?

Q. Is the population remaining in the west as it goes there ?

A. Yes, practically all the immigrants that come to Canada go to the west. A few remain in Ontario, but we find that as many people go from the older provinces to the North-west as the number of incoming immigrants who remain in the older provinces.

Q. It was not so much that point that I wished to get at as whether you had any knowledge of the number that passed into the United States after having come to Canada.

A. From Manitoba and the North-west Territories ?

Q. Yes.

A. We keep a record of all the people who cross the boundary. There are very few British who pass out, they are all foreigners.

By Mr. Richardson :

Q. Have you any account of what number of the Barr colonists have returned to England ?

A. I do not know that any have.

EXPENDITURE ON ADVERTISING.

By Mr. Wilson :

Q. You said one day that the amount of money spent for advertising, &c., in the different countries, for instance in Great Britain, was over $62,000. Where was that printing done ?

A. A good deal in the Old Country, but some was done on this side.

Q. What percentage would be done here ?

A. All the atlases I think, that is the only thing.

Q. We did none of that in Canada ?

A. Not the atlases, no.

Q. Of the $62,000, did you do any here ?

A. Some of it.

Q. What percentage ?

A. We did these school books and we did another little book which I think I have with me. We did perhaps, of that $62,000, in Canada $15,000 to $20,000.

Q. Less than a third of it ?

A. Less than a third of it.

Q. In the United States there was $7,664. What percentage of that was done here?

A. That was advertising. We did not do any of that here.

Q. That was all done in the United States.

A. Not all, because I know we shipped a good deal through to Detroit, perhaps two-thirds was done in the United States.

Q. It would be more than that, for the reason that you would have to pay the duty on things going in.

Q. Well now, on the continent you say there were $4,594 spent ?

A. Yes.

Q. Where was that work done ?

A. I think one-half of that was newspapers sent over, German or Swedish newspapers ; under our arrangement with the steamship syndicate we did agree at that time to furnish $2,500 worth of advertising.

Q. Do you consider newspapers really good advertising matter ?

A. Well, we sent them to addresses.

Q. But there is so very little advertising matter in them.

A. Well, they were prepared specially with a view of being used for immigration purposes.

Q. But they would not be of much value with perhaps one article.

A. No, they had a page, I should think.

Q. Would that be an article like a story, or something like regular advertising ?

A. It would be an account of the country, similar to what appeared in the papers I have shown you.

Q. In Ireland, you spent $2,087 ; there was none of that done there ?

A. No, that is newspapers sent altogether.

Q. Out of all this, there was $149,000 spent, I think. About what percentage of the whole would be done in Canada ?

A. There would be fully one-half of it for advertising, and there would be perhaps one-half of the balance done in Canada; that is, outside the advertising.

Q. There would be perhaps $20,000 or $25,000 spent in Canada altogether ?

A. Perhaps $35,000 or $40,000.

APPENDIX No. 2

By Mr. Ross (Ontario) :

Q. Do you remember off-hand, pretty nearly the amount you have paid ?
A. I do not, but we would much rather spend the money in Canada if we could do it.

By Mr. Wilson :

Q. And we would rather have you do it.
A. We would rather do it too.

By Mr. Ross (Ontario) :

Q. The atlases can not be done in Canada, can they ?
A. No.

By Mr. Wilson :

Q. Your agents have been very industrious this time, or they have acquired wisdom from past experience. I see from the return you have presented they have put in pretty nearly full time this year. In the report of a couple of years ago there was considerable lost time.

A. Perhaps your representations, through the department, and your close questions upon the point, have had an effect.

The statement furnished by the steamship people for the work on the continent shows that they have expended $25,067.30 in general advertising.

Q. Have you that statement, are you going to put it in ?
A. Yes.

Q. You were going to send in some statements in reference to these steamship companies, and we had better have them.

A. I have a statement, a copy of the Order in Council and the agreement with these people.

Q. I think you might as well read that, because if you do not some of us will never perhaps, read it.

EXTRACT FROM A REPORT OF THE COMMITTEE OF THE HONOURABLE THE PRIVY COUNCIL, APPROVED BY HIS EXCELLENCY ON THE 31ST MAY, 1902.

'On a report dated 21st April, 1902, from the Minister of the Interior, stating that it has been found impracticable to establish agencies of the Dominion government in European countries, similar to those maintained in Great Britain and in the United States for the furtherance of emigration from these countries to Canada, and other means of accomplishing this end have had to be resorted to. The plan was first tried of bonusing the steamship companies' local booking agents for all bookings to Canada, but little or no benefit was obtained from this, as the laws prevailing in most of these countries are such that a steamship booking agent cannot undertake to direct emigrants to any one country in preference to another, his business being simply to book passengers to any country to which they may apply to him for tickets. The emigrants themselves must name the place of their destination, any attempt at direction on the part of the ticket agent subjecting him to penalties of more or less severity.'

'The Minister observes that, therefore, about two years ago the Immigration Department made a tentative arrangement with an organization known as the North Atlantic Trading Company, composed of certain leading representative continental steamship agents, having its headquarters at Amsterdam, in the kingdom of Holland, whereby this company undertook to represent the immigration interests of Canada in Russia, Germany, Austria, Roumania, Switzerland, Italy, Holland, Belgium, France, Norway,

Sweden, Denmark, and such other countries as might be agreed upon from time to time.

'In pursuance of that arrangement, the company has since maintained an effective immigration propaganda for Canada in those countries, by advertising, printing and circulating suitable literature by mail and personal distribution, and by the employment of duly qualified agents, and has succeeded in carrying on its operations without provoking the opposition of the authorities in any of the countries named.

'The Minister further states that the company having done its work to the satisfaction of the Immigration Department, and with much better results than were obtained through the plan previously existing, it is now proposed to enter into a definite agreement whereby the Department of the Interior will grant to the aforesaid North Atlantic Trading Company a bonus of £1 for each man, woman and child of the agricultural class only, and for each girl over eighteen years of age of the domestic servant class, who may emigrate to and arrive in Canada from the following countries: Belgium, Holland, Denmark, Russia, Germany, Austro-Hungary, Northern Italy, Luxumberg, Roumania, Bulgaria, Servia, Switzerland, Norway, Sweden, Finland and any other countries which may hereafter be included in the agreement, France being omitted for the reason that the department is free under the local laws to maintain agencies in that country.

'The Minister submits that the conditions of the agreement are as follows :—

'The company shall undertake a systematic and persistent propaganda in the countries named, by which people in the agricultural districts shall be made aware of the advantages offered by Canada as a field for settlement, by advertisements in the public press, by pamphlets published by the company in the various languages of the countries referred to, and by personal canvass by representatives of the company, all advertisements and publications of the company to be approved by a representative of department in advance of publication.'

'The company agrees that a sum of money not less than £3,00 or $15,000 shall annually be expended by them in carrying on this work.'

'It is agreed in respect to settlers from Galicia, Roumania, Servia and Russia, excepting Germans, that each married man and wife shall be possessed, between them, of not less than $100, and $25 for each of their children, the amount for a family being fixed at $200, and in the case of unmarried men and women, they are to be possessed of at least $25 each, the amounts named being over and above the cost of transportation to Canada. There will be no money restrictions with respect to other immigrants.'

By Mr. Wilson :

Q. Have you exercised restrictions at the seaport ?

A. Yes, we have carried that out to the letter. We get the information from these particular people as they land at the seaports, and also, in order to make sure, we get a sworn statement from the money changers, who change their money at the seaports.

Q. What I understand is that the law, strictly speaking, is such that you cannot do that?

A. We do that.

Q. You do not allow them to land if they have not the money ?

A. No, this is not prohibitory against landing, this is only the standard upon which we pay the bonus.

Q. You do not prevent them landing because they have not the money, or because they are paupers ?

A. Yes, we do prevent paupers from landing ; we prevent persons from landing who we believe will become a public charge ; but because a man has not much money in his pocket it does not make him a pauper.

APPENDIX No. 2

Q. I do not believe you have law for that.

A. I believe we have ; the Immigration Act provides for that.

Q. I was talking to a gentleman who ought to be well informed on that, and he said there was no law for that.

A. Well, we send the people back.

Q. I see that by the report, but I notice that a lot of people who were rejected by the Americans you allowed to stay.

A. Yes, but they are not a public charge; the Americans have a money standard, but I do not think they exact it in all cases, because the average money possessed by immigrants, according to their reports, was only six dollars, while the law requires that they should have $30.

DEPORTMENT OF UNHEALTHY IMMIGRANTS.

By Mr. Ross (Ontario):

Q. I see by the papers that there were twelve or fifteen sent back from Quebec last week; what was the cause; they were held up by our government ?

A. That was because of Trachoma.

Q. That is a disease of the eye ?

A. Yes.

Q. Is it dangerous ?

A. Yes, it is dangerous, because it is contagious. The Americans have been very strict, in fact our doctors inform me, at least one of them, the one having the most experience, that if a person has a sore eye, red eyes, the American Commissioners will reject him. He says that Trachoma, so called, in a great many cases is not Trachoma.

By Mr. Heyd:

Q. Is that disease, Trachoma, confined to one nationality ?

A. No, it is general.

By Mr. Wilson :

Q. I saw a Canadian doctor myself examining them, and he pointed out the granules of the disease ?

A. We thought of having an expert come in at some time, a specialist, to make an examination where there is any doubt about it, because it is rather absurd that when a man's eyes are inflamed he should be forcibly taken back and put aboard ship and sent back to the country whence he came. One thing is certain that although this law is only new in Canada, we have had people landing here for the last five or six years and we have never heard anything in the shape of Trachoma.

Q. A case came to my notice where a family divided, the wife went to New York and the husband came to Canada, and it was thought he had Trachoma, and of course he was put in the hospital for a while, but he got over that. It is said that heretofore they have come through Canada if there has been any doubt as to whether they were able to pass the examination at the American seaport ?

A. I do not think that was the reason.

Q. Mr. Watchorn gives that as the reason why people going to the United States come through Canadian ports ?

A. There is another reason why they come that way, and that is that the Canadian transportation companies have been independent; the Elder Dempster Company have been independent of the conference, and they have reduced rates in some cases as much as $10 for crossing the ocean.

Q. But that would not apply to a case like what I have spoken of ?

A. That may be true in that case, but they hold that up, throughout, that these people come through Canada to escape inspection.

By Mr. Heyd :

Q. They come in to save $10 ?

A. They come in to save their fare ; and the reason the American Government—there is no doubt about that—is holding up all they can coming from Canada—is to get them to go by United States lines. That is reported, and it is perfectly reasonable.

Q. That is reported I know ?

A. There is no doubt about it.

Q. They want to enforce their union ; they want people to travel by the American lines ?

A. Yes.

'In order to ascertain the amount of money possessed by the immigrants to whom this restriction applies, it is agreed that the company shall be required to establish the facts by reasonable evidence if requested by the government.

'In order to assist and encourage the company in a special effort in Norway, Sweden and Finland during the next two years, and after that in any countries which the Department may name, the Department may make a grant to the company of £750 for special work, on the condition that the company will supplement this amount by an actual expenditure of £1,000 on the same special work.'

We want to cut in and get some of these people who are now going to the States. The Swedes are good settlers.

'It is agreed that the duration of the contract with the Company shall be for a term of ten years, subject, however, to the right of the department to cancel it upon reasonable evidence that the Company is failing to carry out the conditions in any particular, and subject also to the right of either party to terminate the contract on two years' notice from the first of January in any year.

'Bonuses earned under the agreement are to be paid by the Department to the company quarterly, it being clearly understood that no bonus is to be paid on any except those immigrants who have been occupied in farming operations in the countries named in the agreement.'

The bonuses are only to be paid on agriculturists.

By Mr. Wilson :

Q. Is not Sweden the country where these diseased immigrants go, to sail from?

A. No, I don't think so.

By Mr. Heyd :

Q. There is a clause prevents them being brought ?

A. We do not pay the bonus on them.

Q. That disposes of the idea that diseased people come through Sweden ?

A. I don't think there is anything in that.

By Mr. Wilson :

Q. The shipping agents get the bonus though ?

A. On that side, not our bonus.

'No bonus is to be paid on any immigrant not mentally or physically fit, or who is a criminal, and any expense incurred in having such persons cared for and deported may be charged to the company.

'The company has agreed to deposit and has deposited with the government of Canada the sum of £1,000 as security for the due fulfilment of the contract on the part of the company. This sum is to be retained for a period of three years, and interest is to be allowed thereon at the rate of three per cent per annum. The company is to do nothing in contravention of the laws of the countries named.'

Q. I see you are asking $150,000 more this year, is that all ?

A. I think that will be enough for next year if we get it.

APPENDIX No. 2

TOTAL Annual Immigration to Canada, from 1897 to 1902, inclusive, Classified by Nationalities.

—	CALENDAR.				FISCAL.		CALENDAR
	1897.	1898.	1899.	1900.	1901.	1902.	1902.
English and Welsh	9,393	9,475	8,576	8,184	9,401	13,095	15,863
Scotch	1,239	1,400	1,337	1,411	1,476	2,853	3,401
Irish	751	733	747	765	933	1,311	1,531
From British Isles	11,383	11,608	10,660	10,360	11,810	17,259	20,795
Galicians	3,917	4,010	6,700	6,593	4,702	6,550	8,367
Germans	636	563	780	705	984	1,048	1,302
Hungarians	540	740	276	530	546	1,048	1,894
Austrians			131	248	228	320	
Scandinavians	718	724	1,526	2,380	1,750	2,451	2,967
Doukhobors			7,350				
French and Belgians	740	545	413	483	492	654	520 292
Russians and Finlanders			735	2,067	1,726	3,759	3,948 1,813
United States	712	9,119	11,945	15,500	17,987	26,388	32,880
Miscellaneous	1,370	3,703	4,027	5,831	8,924	7,902	9,257
Total arrivals	20,016	30,742	44,543	44,697	49,149	67,379	84,035
Declared to U.S.A., (passed through Canada)	7,905	9,872	14,625	24,783	19,861		29,254

NATIONALITIES OF ARRIVALS DESTINED FOR CANADA, DURING CALENDAR YEAR, 1902.

Arabian	74
Assyrian	5
Armenian	133
Australian	29
Austrian	486
Bermudian	1
Bohemian and Moravian	8
Belgian	292
Bohemian and Moravian	3
Bukowinian	1,043
Chinese	1
Croatian and Slavonian	58
Dutch	38
Egyptian	1

French	520
Finnish	1,813
German	1,290
Galician	7,324
Greek	216
Great Britain—English	15,424
" Welsh	439
" Scotch	3,401
" Irish	1,531
West Indian	11
Hebrew	2,027
Hungarian	1,297
Maltese	1
Mennonites	24
Moldavians	280
Newfoundland	175
New Zealand	2
Italians	3,914
Polish	345
Persian	6
Roumanian	287
Russian	3,948
Slovak	45
Spanish	7
Swiss	44
Saxon	12
Syrian	1,138
Scandinavian—Danish	194
" Icelandic	408
" Swedish	1,578
" Norwegian	1,195
Turkish	47
U.S.A. citizens	137
Ocean ports	51,155
Nationalities per ocean ports	51,155
Returned Canadians	3,424
Tourists	253
Total at ocean ports	54,832
From U.S.A. at Winnipeg and outports	32,880
Total	87,712

APPENDIX No. 2

MEDICAL Inspectors' Record of Examinations of Immigrants.

Date.	Disease.	EXAMINED.		DEPORTED.		TREATED.		UNDER EXAMINATION.	
		Canada.	America	Canada.	America	Canada.	America	Canada.	America
St. John—									
Dec. 1902....	Trachoma ..	29	39	27	30	2	19	2	12
"	Favus	1	1	1	1				
"	Pneumonia	1	1			1	1		
"	Measles	1				1			
"	Pregnancy		1				1		
"	Frost Bite		1			1			
"	Accompanying..		8		7				
Jan. 1903....	Trachoma	71	27	30	11	41	16	23	16
Feb. 1903....	Trachoma	7	38		6	6	32		
"	Measles	2				2			
"	Accompanying..	3							
Mar. 1903...	Trachoma	18	30	2	9	16	21		
"	Syphilis	1		1					
Halifax—									
Feb. 1903....	Trachoma	4	5		1	4	4	5	4
Mar. "	Trachoma	53	14	18	1	13	7	22	6
"	Favus	1		1					
April "	Trachoma	89	9	28	3	20	4	16	1
"	Alopecia.....		1				1		
"	Accompanying..	3	6						
Totals	Totals	284	181	168	69	107	106		

The following list is subject to constant change.

CANADIAN LOCAL COMMISSION AGENTS IN THE UNITED STATES FOR 1901-1902.

MICHIGAN.

D. Allard, Milwaukee.
G. H. Arnott, Levering.
Wm. Akins, Vassar.
Geo. H. Beach, North Branch.
F. M. Beaman, Albion.
Thomas. Brennan, Chesaning.
F. Bellinger, Bessemer.
Wm. Benn, Saginaw.
W. Bingham, Gagetown.
Wm. Bolton, Midland, Midland County.
Ed. Bosely, Unionville.
D. Brown, Sebewaing.
E. W. Brown, Farewell.
Jas. W. Bauer, Hastings, Barry County.
E. G. Brainard, Stanton, Moncton Co.
N. P. Chamberlain, Mancelona.
C. H. Clark, Stamford.
W. H. Cline, Mount Pleasant, Isabella County.
Geo. Cockburn, Ludington, Mason Co.
Martin Conaton, Bad Axe.
H. C. Cudney, Ewart, Osceola Co.
E. A. Convis, Owesso.
J. J. Dodge, Decatur, Van Buren Co.
Jno. Doyle, Saginaw.
W. H. Simmons, Doyle, St. Clair.
T. E. McDonough, St. Clair, St. Clair Co.
R. C. Sawdey, Coldwater.
M. F. Denyes, Caro.
H. H. Davis, Caseville.
J. K. Durst, Gaylord, Otsego Co.
T. H. Ferris, Pinconning.
G. Freeman, West Harrisville.
A. Ford, Charlotte, Eaton Co.
Dr. S. J. Gareau, Saginaw.
Henry T. Gilbert, Sand Beach.
Geo. Greenwood, Elmira, Otsego Co.
Bruce Green, Manton.
Erastus Harris, Lakeport.
F. C. Harrison, Howard City, Montcalm Co.
V. S. Hollinbeck, Alma.
L. H. Howse, Brown City.
A. F. Houston, Croswell, Sanilac Co.
G. T. Field, M.D., Chase.
H. D. Kellar, Wyandotte.
Walter S. Keyes, Coleman.
R. A. Kilgour, Marlette.
A. Lieberthal, Ironwood.
James Lyle, Fife Lake, Grand Traverse Co.
Angus Mckay, Port Huron.
D. J. McGinnis, Cooks, Schoolcraft Co.
James McLean, Reed City, Osceola Co.
R. H. Martin, Standish.
W. A. McLean, Greenville.
Geo. E. Newell, Flint.
Ernest Nicholson, Luther, Lake Co.
N. J. Oliver, Black River.
V. A. Poole, Cedar Springs.
Frank A. Wickens, Box 134, Pontiac.
H. C. Pierce, Elk River.
M. F. Quaintance, Petoskey.
J. A. Redmond, Sanilac Centre.
Grant Reed, Vernon.
Dell Roberts, Le Roy, Osceola Co.
V. S. Rolfe, Tustin.
Rev. Alebrt E. Seibert, Lake View.
F. Schmack, Sebewaing.
J. N. Simmons, Deckerville.
H. A. Spencer, Cadillac, Wexford Co.
B. S. Stratton, Owosso.
Wm. C. Sutherland, Sault Ste. Marie.
Smith & Crane, Eaton Rapids, Eaton Co.
A. L. Thomas, Grand Haven.
Jno. F. Turner, Clifford.
A. J. Urquhart, East Tawas.
L. E. Vorce, Frankfort.
John Warehook, Parisville.
J. H. Westerman, Paris, Nocosta Co.
O. W. Wiley, Big Rapids.
John Wilson, Carsonville.
Rev. A. Wood, Munith, Jackson Co.
W. Wallace, Ionia, Ionia Co.
Woodworth & Turtle, Traverse City.
J. P. Galliver, Clare, Clare Co.
W. A. Thomas, Bay City.
O. H. Todd, Centreville, St. Joseph Co.
W. S. Wilson, Barrytown, Mecosta Co.
W. S. Tallant, Shelby.
W. D. Springer, Whitehall.
Rev. B. Merry, Joyfield.
A. J. Gibson, Kalkaska, Kalkaska Co.
James T. Mason, Clarkston.
W. W. Finch, Hancock.
N. E. McKinnon, Farington, Oakland Co.
Geo. W. Petrie, Lapeer, Lapeer Co.
Isaac Turner, Saginaw.
Joseph Fisher, Leesville, Wayne Co.

IOWA.

J. M. Roberts, Des Moines.
John Bellings, Gowie, Webster Co.
Elmer Bruce, Laporte City, Blackhawk Co.
C. J. Kuehl, St. Ansgar, Mitchell Co
J. T. McFee, Lennox, Taylor Co.
C. B. Byer, Hartley, O'Brien Co.
Herman C. Mills, Okoboji.
S. F. Boyd, Davenport.
L. L. Klinnefelter, Mason City.

APPENDIX No. 2

SOUTH DAKOTA.

Jas. A. Brooks, Watertown.
C. S. Doolittle, Ipswich, Edmunds Co.
J. W. Keating, Clark.
John Sorenson, Redfield.
J. Trenholm, Henry.
J. Heinz, Mission Hill (or Volin).
E. H. Darrow, Sioux Falls.

NORTH DAKOTA.

Henry M. Marcoe, Church's Ferry.
J. W. Sanutee, York.
Rev. F. A. Muller, Cathay, Wells Co.
E. T. McAlpine, Hannah (or Langdon).

MISSOURI

Fred D. DeMott, Hopkins.
M. D. Shamblin, Bethany.
M. R. Griffith, Kansas City (care of J. S. Crawford).

TEXAS.

Louis Lund, Olivia, Calhoun Co.

NEW YORK.

A. P. Shutt, Perry, Wyoming Co.
Wm. E. Adams, 346 Dyke Street, Wellsville, Alleghany Co., 346 Dyke St.

INDIANA.

J. K. Vance, Farmland.
P. B. Bolinger, Shipshewana.
Everett & Kautz, National Real Estate Company, Rooms 30, 31, and 32 Tri-State Building, Fort Wayne.
Wm. K. Keck, Hamlet.
Frank Fisher, Mexico.
Howard W. Smith, Indianapolis.

CALIFORNIA.

C. J. Nelson, Kingsbury, Fresno Co. California.
Wm. H. Thornley, 332 Washington St., San Francisco.
Newton, Hogan, 3441 Hough Street, Los Angeles.

KANSAS.

Chas. F. Soper, Medicine Lodge.
Jos. W. Sims, Howard, Elk Co.
H. H. Fast, Hillsboro.

IDAHO.

J. B. Anderson, Idaho Falls.

NEBRASKA.

J. J. Barge, Beemer.
A. S. Fielding, Lincoln.
D. R. Buck, Omaha.
G. F. West, 1401 Franam Street, Omaha.

PENNSYLVANIA.

A. W. Alexander, Burnham.
Samuel Dunseith, Room 74, 339 Fifth Street, Pittsburg.

ILLINOIS.

A. M. Gittard, Arthur.
W. R. Perty, Ashton.
Jos. Garney, Harvey.
Rev. Father Bourassa, Pullman.
L. B. Dickey, Chicago.
J. B. Green, Ransey.
W. A. Shonkwiler, Atwood.
R. S. Elworthy, Chicago.
John Haacke, Canton.
G. E. Stebbins, Marseilles.
J. H. Ray, Wilmington.

MINNESOTA.

N. Campbell, Crookstown.
B. Crane, Jackson, Jackson Co.
F. W. Goertz, Theilman.
J. C. Koehn, Mountain Lake.
S. F. Long, Worthington, Noble Co.
H. E. McGonigle, Waseca.
Nilsson & Nordlander, 104 Washington Ave., Minneapolis.
J. H. M. Parker, Duluth.
P. W. Simpson, Hutchinson.
Peter Johnson, Preston.
John Martin, Barnesville.
J. A. McKay, Alexandria.
F. J. Pearson, Ulen.
Abel Armstrong, Hendrum.
A. M. Eklund, Hallock.
Martin, C. Johnson, Saulpaugh Block, Mankato.
John P. Tuff, Fertile.
James Kelly, Wadena.
F. G. Dennicliffe, Windom.
Peter Johnson, Fosston.
G. Mix, 1316½ First Street (south), Minneapolis.
R. Price, Fairmount.
E. J. Meilicke, Windsor.
M. J. Jacobson, Wheaton.
R. R. Stoner, Winthrop.
James Malone.
Robert Pearce, Clear Lake.
L. O. Kirby, Little Falls.
B. B. Haugen, Fergus Falls.
F. J. Lange, 1228 Washington Ave. (north), Minneapolis.

WISCONSIN.

F. S. Baldwin, Waupeca.
A. W. Ballantyne, South Milwaukee.
Wm. Barr, Jefferson.
J. F. Clark, Rent Block, Oshkosh Co.
W. D. Corrigan, Plainfield.
P. Cress, Phillips.
R. J. Dugdale, Plattsville, Grant Co.
W. W. Fisher, Ashland.
S. D. Forbes, Westfield.
Wencer Fox, Iron River.
Robert Lanp, Madison.
Frank Heidt, Portage.
A. L. Hellwig, Bayfield.
A. C. Herman, New London.
C. M. Jelliff, New London.
H. C. McRae, Chippewa Falls.
John R. Means, Steven's Point.
A. B. Noble, Ashland.
J. Ross Porter., Mount Morris.
Samuel Shaw, New Richmond.
Stephen Plumley, El Paso, Pierce Co.
Thos. Fairbairn, New Insurance Building, Wilwaukee.
Frank Hurd, Wabasha.
Hans O. Erickson, Tomahawk.
D. McQuane, Hayward Sawyer Co.
John A. Flanigan, Junction City.
Jno. H. McRae, Suite 1, Ingram Block, Eau Claire.
C. H. Hegge, 1531 George Street., La Crosse.
Ferdinand Hemmings, 124 Second Street, Milwaukee.
Wm. Kissack, West Salem.

ONTARIO.

R. A. Burriss, Port Arthur.
Oliver B. Stockford, Rat Portage.

NORTH-WEST TERRITORIES.

H. L. Briggs, Eastlohs Ranche, Olds, Alberta.

UTAH.

Alan Wakeling, Robinson, Juab Co.
J. W. Taylor, Salt Lake City.

MASSACHUSETTS.

H. E. Street, 111 Sixth Ave. Boston.

APPENDIX No. 2

MONTANA.

Walter Matheson, 111 Sixth Ave., Helena.
John Smith, Havre.
Wm. Sanderone, Fort Benton.
Messrs. Griffin & Stannard, Kalispell.

ENGLAND.

C. W. Heywood, 53 Osborne Road, South Shore, Blackpool.

KENTUCKY.

M. V. Bates, Cedar Grove.
H. C. Snyder, 445 E. Market St., Louisville.

HUNGARIAN.

Zoltan Von Rajcs, Prince Albert, N.W.T.

OKLAHOMA.

A. F. Mood, Stillwater.
W. L. Thomas, Oklahoma City.

STATE OF WASHINGTON.

Henry Cook, care of D. Eshelman, Sec. Building & Loan Association, Tacoma.

INDIAN TERRITORY.

W. H. Williscroft, Checotah.

OHIO.

C. T. Amsden, Greenwich, Huron Co.
F. B. Barbor, Colebrook.
J. C. Bigelow, Box 23, Bostwick, Geauga Co.
G. W. Carter, Osborn.
Wm. Gates, 403 Madison Street, Toledo.
E. B. Gorsuch, Springfield.
H. C. Long, 227 Herman Street Cleveland.
C. W. Morduff, 203 North High Street, Columbus.
W. M. Morlan, 421 Lincoln Ave., E. Liverpool, Columbiana Co.
Ellsworth Mosier, Chesterhill, Morgan Co.
Frank E. Moore, Alavada, Seneca Co.
John H. Nigh, Box 12, New Washington, Crawford Co.
W. S. Sears, Sidney.
Gamble Shields, Marysville.
A. J. Sims, Kent.
Jas. M. Smith, Bloomville, Seneca Co.
Thos. Shanyfelt, Dixon, Van Wert Co.
C. S. Wallace, Moark Centre,
E. G. Wickersham, Grover Hill.
Willard S. Weaver, Germantown, Montgomery Co.
John M. Willeman, Box A, Florida, Henry Co.
Geo. A. Whitney, 205 Spitzer Building, Toledo.
E. J. Reeves, Higginsport, Brown Co.
C. J. Nelson, Kent.
E. H. Sills, Newcomerstown.
C. B. Johnston, Van Wert.
Albert Pickering, 199 North High Street, Columbus.
W. H. Wark, Attoca, Seneca Co.
G. W. Squiggins, Cleveland.
Chas. H. Smith, Chittington Block, Columbus.
Chas. G. Smith, Chittington Block,
R. D. Woodwansee, 52½ East State St., Columbus.
Wm. A. Hanna, Napoleon.

LIST OF CANADIAN IMMIGRATION AGENTS AND EMPLOYEES IN THE UNITED STATES.

Name.	Rank, &c.	Salary.
		$ cts.
W. J. White	Inspector, &c.	2,200
M. V. McInnes	Agent, Detroit	1,800
F. S. Longworth	Clerk, "	750
M. V. McInnes, sr.	" " (Temporarily per month at)	25
C. A. Laurier	Agent, Marquette City	1,200
E. T. Holmes	" St. Paul	1,500
Miss M. Dass	Clerk, "	720
Miss Krhoun	" " (Temporarily per month at)	25
C. O. Swanson	Agent, "	1,500
A. E. Hedin	Clerk, " (Temporarily per month at)	65
T. O. Currie	Agent, Milwaukee, Wis	1,200
J. M. MacLachlan	" Wausau, Wis	1,200
Jas. Grieve	" Sault Ste. Marie	1,500
J. S. Crawford	" Kansas City	1,200
W. H. Rogers	" Watertown, S.D.	1,200
W. V. Bennett	" Omaha	1,200
J. C. Duncan	" Indianapolis	1,200
H. M. Williams	" Toledo	1,200
C. J. Broughton	" Chicago	900
Benj. Davies	" Great Falls, Mont.	1,200
Chas. Pilling	" Grand Forks, N.D.	1,200
Damas Gauthier	" Laurentides	1,000
R. A. Burriss	" Port Arthur	1,200
A. Ribout	" Mattawa	1,200
Rev. M. Blais	Repatriation Agent, Montreal	600
Rev. H. L. Vachon	" " Beauharnois	500

LIST OF CANADIAN SALARIED STATE AGENTS IN THE UNITED STATES.

M. V. McInnes, 6 Avenue Theatre Block, Detroit, Michigan.
James Grieve, Sault Ste. Marie, Mich.
C. A. Laurier, Marquette, Mich.
J. S. Crawford, 822 Walnut street, Kansas City, Missouri.
T. O. Currie, Room 12, B. Callahan Block, Milwaukee, Wisconsin.
J. M. MacLachlan, 307 Third street, Wausau, Wis.
E. T. Holmes, 315 Jackson street, St. Paul, Minn.
J. H. M. Parker, 213 Providence Building, Duluth, Minn.
W. V. Bennett, 801 New York Life Building, Omaha, Nebraska.
Chas. Pilling, Clifford Block, Grand Forks, North Dakota.
W. H. Rogers, Watertown, South Dakota.
H. M. Williams, Room 15, Law Building, Toledo, Ohio.
John C. Duncan, Room 6, Big Four Building, Indianapolis, Indiana.
C. J. Broughton, Room 430, Quincy Building, Chicago, Ill.
Benjamin Davies, Great Falls, Montana, (Ford Block).

These are called State Agents, and they have working under them 280 sub-agents who work on commission. We pay the commission agents by results : $3.00 for each male adult 18 years of age, or over ; $2.00 for each female adult 18 years of age, or over, and $1.00 a head for all under 18 ; the commissions being paid on the exchange of certificates issued by the agents for settlers' rate tickets on the Canadian Pacific Railway and the Canadian Northern Railway.

One evidence that we have of the success of our work in the United States is the opposition it is now provoking.

APPENDIX No. 2

NUMBER OF PERSONS BROUGHT INTO CANADA FROM THE UNITED STATES BY SALARIED STATE AGENTS, AS SHOWN BY THEIR REPORTS.

State.	Agent.	Number.
Michigan	M. V. McInnes	3,261
"	James Grieve	2,175
e "	C. A. Laurier	46
Indiana	Ed. T. Holmes (not reported)	
Ohio	Jos. Young	225
a "	H. M. Williams	
b North Dakota	Chas. Pilling	5,200
South Dakota	W. H. Rogers	2,550
Wisconsin	T. O. Currie	1,122
c "	J. M. MacLachlan	28
Nebraska	W. V. Bennett	2,977
d "	J. C. Duncan	
Missouri	J. S. Crawford	1,400
Illinois	C. J. Broughton	516
Minnesota	B. Davies	1,061
Headquarters in Canada	C. O. Swanson (not reported)	
"	Rev. M. Blais	90
"	Damase Gauthier (kept no record)	
"	R. A. Burriss	364
"	Lake St. John Repatriation and Colonization Society	2,077
"	A. Ribout	480
"	Montreal Colonization Society	149
	Total as reported by agents	23,721

a. H. M. Williams commenced work in November, 1901. *b*. Chas. Pilling was transferred to North Dakota in June, 1902, Wm. Ritchie was the local agent until then. *c*. J. M. MacLachlan was at work for a few months only. *d*. J. C. Duncan was transferred to Indiana in June, 1902. *e*. C. A. Laurier was only at work for a portion of the year in new territory.

J. A. SMART,

Deputy Minister of the Interior.

IMMIGRATION AGENCIES TO THE UNITED STATES, 1890-'95.

HOUSE OF COMMONS,
COMMITTEE ROOM 34,
WEDNESDAY, 10th June, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock a.m., Mr. Douglas, chairman, presiding.

Captain A. F. Holmes, Napanee, Ontario, was present by citation, and was examined as follows :—

By Mr. Wilson :

Q. Would you like the public records in the Library containing your reports to the government on immigration from the United States brought up ?

A. I would not know very much about it unless I did see those.

By Hon. Mr. Fisher :

Q. I would like to ask Capt. Holmes a few questions while we are waiting for these records to be brought up. I understand, Capt. Holmes, that you were in the Government employ; during what years and in what capacity?

A. Well, I was first employed by the Government in 1887 I think first, in 1888 and 1889 afterwards on the government cruiser.

Q. Not in immigration ?

A. I entered the employ of the immigration department first, on September 1, 1890.

By Mr. Wilson :

Q. What reports do you want ?

A. Department of Agriculture for 1891 and 1892, and Department of the Interior from that on.

Q. You want 1892 and 1893 as given on the backs of the volumes ; because the date on the back is the year of the session in which they are presented, while the reports inside are for the fiscal year ending the year before ?

A. Yes.

Q. You want the reports of the Agriculture Department for the fiscal years ending in 1891 and 1892 ?

A. Yes.

Q. And the Interior for 1894, 1895 and 1896 ?

A. 1893 of the Interior I think contains something, and then 1894, 1895 and 1896.

By Hon. Mr. Fisher :

Q. What years were you employed in immigration work ?

A. 1890, 1891, 1892, 1893, 1894 1895, and up to July 1896.

Q. July, 1896 ?

A. Yes.

Q. Were you then dismissed by the government, or what was the reason for ceasing to be in their employ ?

A. No, I was not dismissed. It was usual for the last three or four years of my employment to lay off in July and August on account of the fact that nothing could be done in the United States in that time, on account of the harvest or one thing and another, and they always claimed that the money was exhausted and they would have to lay us off anyway. I was laid off in 1896 during July and August, and of course after the elections I did not appear as an employee of the Department owing to being laid off.

By Mr. Wilson :

Q. Then you were not dismissed ?
A. No, I never received any notice of dismissal.
Q. The statements to that effect made this morning were unfair then ?
A. Yes.

By Hon. Mr. Fisher:

Q. During the time you were in the employ of the Government you were working in the United States ?
A. Yes.
Q. And during that time made reports of the year's work ?
A. Yes.
Q. To the department ?
A. Yes.
Q. Regularly every year ?
A. Every year.
Q Stating the work you were doing and the result of that work ?
A. Yes.
Q. Do you know to what official of the Department these reports were made?
A. For 1890 and 1891-2 it was to the Department of Agriculture.
Q. Yes, but to what officer of the Department?
A. To the Hon. John Carling.
Q. He was the head of the Department; did you report direct to the Minister?
A. I addressed my reports direct to the Minister, I think, but they were addressed to the 'Minister of Agriculture.'
Q. What official of the Department was your immediate superior, gave you instructions, and under whom you served ?
A. The instructions I received from the Department of Agriculture were entirely from the Minister.
Q. Direct for the Minister ?
A. Direct from the Minister, and a little before the work was taken into the Department of the Interior I had received instructions from Mr. Lowe, but it was only to write a report.
Q. I would like to ask you again if you had your instructions direct from the Minister ; did you receive letters from the Hon. John Carling giving you instructions and then did you make reports direct to him as head of the Department?
A. I made reports to him, but didn't receive any written instructions from him.
Q. Who did give you instructions ?
A. The only written instructions I had were from Mr. Lowe, and that was only once.
Q. You only received instructions once in three years ?
A. In two and a half years.
Q. But in all the time you were in the Agriculture Department you only had written instructions once, and that was from Mr. Lowe?
A. Yes.

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INITIATION OF SENDING IMMIGRATION AGENTS INTO THE UNITED STATES.

Q. So your instructions were verbal and from whom ?

A. From the Hon. John Carling, and the first instructions I got were to go to North and South Dakota and Nebraska and see what the situation was. I went first to North Dakota and found that was not a very good time for anything to be done there, as conditions were very similar to what they were in Manitoba. From there I went to South Dakota and found the condition very different. I went on then to Nebraska, and found they were having a hard time there. I made a report to the Minister, and was asked to return to Ottawa and consult those in authority on the situation. I did return to Ottawa, and the Minister asked me what I thought was the best thing to be done. I told him the best thing was to buy a cheap rig and drive through the country. He told me to do so, but not to exceed $100. I said I could get a horse, buggy and harness for that, and I got a written order, after, for them. I drove into the country. I took up four or five delegates that fall to Assiniboia and Alberta, and some fifteen or twenty people left and went up to Assiniboia; that was the fall of 1890.

Q. In your instructions were you given charge of any particular work beyond what you say to go and buy a rig and drive through that State; was there any particular work you were given the charge of ?

A. No. There were only three of us altogether ; Webster and McInnes.

Q. They were working in the States in conjunction with you ?

A. Yes.

Q. You consulted together ?

A. Yes, before going there.

Q. And laid out the work ?

A. Yes.

Q. No one of you was in charge ?

A. No.

Q. And you were directly under the Minister, all three of you ?

A. Yes.

Q. After that you were employed for four years in the Department of the Interior; was the same system pursued there ?

A. No. I was in charge of the work I think in January, 1893.

Q. That is of the work in the United States ?

A. Yes.

Q. And then these men were working under you ?

A. Yes.

Q. Who were the men, had you the same two ?

A. The same two, and my recollection is that there were twenty-four others for the season of 1893 only. I think they were more than half let go at the end of 1893.

Q. More than half were let go ?

A. I think so. I am speaking from memory.

Q. Of course we understand; we are here to get your memory of these things. You made reports of your work ?

A. Yes.

Q. And the results of it ?

A. As near as I could.

Q. You reported as near as you could what you saw of the results ?

A. Yes.

Q. Of the people coming into this country ?

A. Yes. I took up myself perhaps 200 or 300 families ; I do not know exactly, but perhaps 300.

By Mr. Wilson :

Q. Won't your reports show ?

A. Yes.

By Hon. Mr. Fisher :

Q. You took these up ?

A. And located them.

Q. In the North-west ?

A. Yes.

Q. Were the others working in the same field ?

A. Well not exactly. I think Mr. Webster and one or two went up with parties of delegates, and one man took up a party of settlers, but the others did not take any one but got them together in parties for some one else to look after.

Q. For some other official ?

A. Some other agent. My recollection now is they were all taken up by Webster, McInnes, Code, Scatcherd and myself. I think we were the only persons who personally conducted any settlers.

Q. And you reported steadily and directly to the Department?

A. Yes.

Q. As to what you were doing and what numbers were brought in ?

A. Yes.

EARLY ARRIVALS OF IMMIGRANTS FROM THE UNITED STATES.

Q. I notice here in this statement, which is a departmental record, figures of the people going in in 1890 and 1891 ; have you any idea how many people you brought in, or were instrumental in bringing in, in 1890 and 1891 ; you say you were working then independently ?

A. I know in 1890 I took up there myself—in the first place I took up four delegates and let them choose land for themselves and some sixteen or eighteen others, and about forty heads of families went up to Yorkton and on the land of the Calgary and Edmonton during November and December of 1890. And in April of 1891 I took up —well, I sent first a party of twenty-four families, and then I took a party of forty-three families, went up with them and their effects myself, to Yorkton.

Q. I think you said that year you were working practically alone ?

A. Yes, down in South Dakota.

Q. Had you any other agents ?

A. I was in South Dakota, Mr. Webster was in North Dakota, and Mr. McInnes was in Michigan.

Q. Have you any recollection of what they were doing ?

A. Yes, I know Mr. Webster claimed to have sent sixty or seventy families in 1891, and I think it is likely he did ; and Mr. McInnes' report I think at least would show that many.

Q. These were the only Government agents working in the United States?

A. Mr. Swanson was working in the New England States and sent up some, I do not know how many.

Q. I suppose these families would average about four or five persons each ?

A. About four.

Q. Then you think, roughly speaking, there were about 230 families sent in by you, and at four to a family it would be about 1,000 ?

A. It would be in that vicinity, that is, that I was directing?

Q. And the other agents ?

A. I know there were several families went up independent of us.

Q. I am speaking of the conducted parties ?

A. I think there were 100 families at least. I know my recollection is that for 1891 we sent up in the vicinity of 1,300 or 1,400 people altogether.

Q. We will put that at 1,500. Can you account for this extraordinary discrepancy between the numbers you sent in and the statement of the Department of Agriculture that in 1890 45,895 people are reported as coming in from the United States,

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and in 1891 51,013. The immigration department seems to have accounted for 1,500 ; can you explain the discrepancy ?

A. I do not understand how, unless they took a record of people passing through the country.

Q. Do you know what the records of the Department were made from, how the records of the department were compiled ?

A. I do not know of my own knowledge; I only know what I saw in Winnipeg in the Commissioner's office.

Q. What did you see there ?

A. I saw there that they had apparently an authentic history of same 7,000 or 8,000 passing through Gretna, but I did not see them passing, didn't know they had come.

Q. Had they any person on the frontier to take them ?

A. They had the Customs officers, they had Dr. McFadden's report at Gretna, or wherever he was located, he would have track of the settlers and settlers' effects. That would be at Gretna.

By Mr. McCreary :

Q. What official was that ?

A. Dr. McFadden, the veterinary officer.

Q. At Gretna ?

A. Yes.

Q. Or Emerson ?

A. Emerson was where he was living, but the examination was made, I think, at Gretna.

Hon. Mr. Fisher :

Q. As far as you know these people going in were reckoned whether going through or not ?

A. I think so, I know no other way how——

Q. It is a very extraordinary fact that the records show these and you can only account for 1,500 ?

A. That is all I know.

Q. And there is nothing in your knowledge in the Department to know where they came from?

A. Yes.

Q. And yet you were the recognized official of the Department dealing with this immigration from the States. It is a strange condition of affairs in departmental work at that time ?

A. I never knew how many it was claimed came, but I knew it was understood that some 7,000 or 8,000 crossed over at Gretna.

By Mr. Wilson :

Q. You will have the records there, and what I want you to do is to give us what you know about the work in those years. Perhaps you can tell us why these were not put in the reports ?

By Hon. Mr. Fisher :

Q. These figures show by the records of the department that in 1885 the number of immigrants coming into Canada from the United States was 51,900 ; in 1886, 38,500; in 1887, 44,700; in 1888, 44,300; in 1889, 54,400; in 1890, 45,900, and in 1891, 51,000. After that date they are not compiled. The Department seems to have dropped the compilation. Of course anybody who knows the condition of the country at that time knows how absurd these figures are. The figures are perfectly

ridiculous. I can only conclude, I cannot say that I can prove it, that in 1892 the census returns which had been taken in 1891 showed the Department so conclusively that their figures were so aboslutely unreliable and ridiculous that they ceased compiling ?

A. In my report made on the 31st of December, 1891, I state what I have done during the year, and I wind up with this recommendation, 'The key of the whole situation, in my opinon, is to get a few families from a particular district, get them comfortably settled and let their reports, with the assistance of the agents, do the rest.' Now that is the principle I worked on during all the time I was engaged on immigration work, to get a few parties up there from a particular district and get them settled, and let them report back to their friends.

By Mr. Ross (Ontario) :

Q. That was in 1891 ?

A. In 1891.

Q. And there were how many agents employed then ?

A. There were three.

Q. And what do the returns say was the number of immigrants coming from the United States ?

A. I do not think it states here exactly what the number was, but there is a report here which shows some three thousand odd, went up during that year 1892.

Q. 1892 ?

A. Yes.

By Mr. Wilson :

Q. 1891 or 1892 ?

A. 1891 shows a little over two thousand.

By Hon. Mr. Fisher :

Q. The figures for 1892 were not compiled ?

A. This you see is dated 1892, and my report is up to the 31st December, 1891, and I see that I say here, 'The first lot consisting of about eight families left Aberdeen on the 22nd of March, going direct to Yorkton. Others went to various points between this date and the 26th of April, on which date I left Aberdeen with some forty families and their effects, going to Yorkton, the terminus of the Manitoba and North-west Railway, and thence by team to the lands now known as the 'Dakota Colony.'

Now that would comprise the lot for that time, for April.

By Mr. Wright :

Q. That would be forty-eight families ?

A. Forty-eight families that I took myself. Then there is a place here somewhere, where I say that I sent twenty-eight families the season before, but it must be in another report, but there were twenty-four families during the months of June, July and August, some going to Dakota Colony, west of Yorkton and others to the Prince Albert and Edmonton districts.

By Mr. Ross (Ontario) :

Q. That would be about 72 families for the year ?

A. No, this is only up to August; there were quite a number after that.

SETTLERS' LOAN COMPANY.

By Mr. McCreary :

Q. What is the nationality of these people who went up to Yorkton ?

A. Either Canadians or Americans.

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By the Chairman :

Q. There were a good many Americans ?

A. There were quite a number of Americans.

SETTLER'S LOAN AND TRUST COMPANY.

By Mr. McCreary :

Q. Were there any assisted passages during these years from continental Europe or the United States ?

A. A loan company, represented by Mr. Allan Bridges, Winnipeg, made advances to some few families from Aberdeen, Dakota.

Q. That was the 'Settlers' Loan and Trust Company'?

A. Yes, I think that was the name of the company.

Q. And were they located on the land of the Canada Settlers' Company ?

A. No, on Government lands, on the mapped out route of the Manitoba and North-west Railroad.

Q. Did the Canada Settlers' Company have the odd-numbered sections ?

A. I think the Manitoba and North-west Railway Company had them.

Q. What provision was made for the Canada Settlers' Company advancing money on the homesteads, this being contrary to the Dominion Lands Act ?

A. I do not know, it was done through the Department; they recorded a lien on the homesteads and effects.

Q. Do you know the arrangement they had with the Canada Settlers' Company ?

A. No, sir.

Q. Were there any complaints ever made to you that the settlers were charged two years' interest, which was deducted from the amount they were advanced ?

A. No sir.

Q. And then that they were buying oxen at exorbitant prices?

A. That did not happen with the people I brought ; they did not buy from the Canada Settlers' at all, they had all their own effects and paid nothing.

Q. What did they get the advance for ?

A. To pay off the mortgages in South Dakota so that they could leave, and to pay their passages up. They brought their stuff with them. I suppose that every family had as many as ten cows and one or two span of horses and implements and household effects.

Q. Have you got the names of any of these parties you can furnish us with ?

A. Yes, I can from memory.

By Hon. Mr. Fisher :

Q. You say this amount was advanced to pay off mortgages before they left the United States. How did they know this company would do this ? How did this company get into contact with these settlers ?

A. In the first place I believe that I introduced the idea to Mr. Allan Bridges and to Mr. Eden, of the Manitoba and North-western Railway Company in the fall of 1890, and they sent an agent down in the spring. I wrote back and told them that I had fifty or sixty families who were ready to move if they could get away, but they owed from $250 to $400 each, and that the parties who held the mortgages would not let them get away unless these mortgages were settled in some way, and after considerable correspondence they concluded to send a man down who would make advances, provided he thought the stuff was worth it, and after he came down and looked the effects over, he said, 'Yes, we will loan up to a certain amount on these things.' Then I went to work with the parties and saw the people to whom they owed money, and we made as good an arrangement as we could. We went to the men to whom the money was owed and said, 'This man owes $200. What will you take and give a release of his indebtedness if he leaves and we pay you.' The men were reasonable in most cases and took fifty cents on the dollar. In some they did not.

By Mr. McColl :

Q. These were chattel mortgages?
A. Yes.

By Mr. Wright :

Q. Did I understand you to say the Government paid off the debts of these settlers ?
A. No, the Government had nothing to do with it at all.
Q. Who furnished the money ?
A. The Canada Settlers' Loan Company.

By Hon. Mr. Fisher :

Q. Did they take any lien in any way on the future homesteads of these people ?
A. Yes. They had some arrangement made with the Government. I do not know exactly what it was, but it was by consent, anyway, of the Government, that they were able to record a lien against their homesteads.

By the Chairman :

Q. And chattels as well ?
A. Yes.
Q. I think you will find the fruits of that work in an order that was granted in the House since 1896. I called for it, and it shows that about 80,000 acres were abandoned, that parties who had received lands from that company and had given liens on the land and on their chattels, found they could not live under such conditions and simply abandoned their holdings and left altogether, 80,000 acres in the neighbourhood of Yorkton.

HON. MR. FISHER.—They went to the Land Company, did they not ?

THE CHAIRMAN.—Yes, the land went to the land company and they hold it to-day, but the settlers are gone. You will find a statement of the whole thing in an order of the House that was brought down at my own request some time ago.

MR. WRIGHT.—These immigrants all left, did they ?

THE CHAIRMAN.—Eighty thousand acres were abandoned and they all left.

By Mr. Ross (Ontario) :

Q. Taking the fiscal year 1891, about how many people did you bring into the country from the United States ?
A. Well, I would place it at about 1,200 or 1,500.
Q. And there were three agents in the field ?
A. Yes.
Q. And you were probably as successful as any of them ?
A. I think I took in as many, anyway.
Q. That would make a total of about 4,500 people ?
A. Not to exceed that.

By Mr. McCreary :

Q. When you went down to see these people you practically acted as agent of the Canada Settlers' Company ?
A. I had not anything to do with it.
Q. But you told us how you arranged with them ?
A. Yes, that was my own proposition. As soon as I had been there among the people I wrote to Mr. Bridges.

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By Mr. Wilson :

Q. You do not mean to say that the government gave you such instructions ?

A. No, they did not know anything about it, in fact, until steps were taken by Mr. Bridges or Mr. Eden, to see whether they could hold a lien against the homesteads. I told Mr. Lowe, if I remember aright in January, 1891, that there was a company in Winnipeg who would advance money, and that if they did we could take a number of people up to the North-west. I do not know what his reply was to that, at any rate, he said the Government could not advance any money that way.

By Mr. McCreary :

Q. Outside of those that came up and settled upon the Canada Settlers' Company's land, how many of these people did you bring to the Yorkton district?

A. Probably one-half of them during that year came in under the auspices of that company ; after that I do not think there were any of them who got advances from the company in 1891.

By Mr. Stephens :

Q. How do you account for the difference between what you say came in and what the report says, some 44,000 ?

A. I do not pretend to account for it at all ; I do not know how it was done. I suppose a record was taken of every one who came in from any part at all, whether they were passing through or staying ; I am only guessing, but I know that from the number reported in the returns as coming in from Victoria or Vancouver, I am quite satisfied it must have meant all those who arrived in the country, whether they were passing through or remaining, because certainly there was no such number of settlers came in.

EMIGRATION FROM CANADA TO THE UNITED STATES.

By Mr. Ross (Ontario) :

Q. In 1891 were there many people settling in the United States who were going from Canada ?

A. There were not many at that time, they had stopped going ; they commenced moving in from Dakota and Nebraska into Canada in 1891 ; but along about 1886 and 1887, the immigration into the United States commenced to drop off, and in 1889 and 1890, they commenced to move out again as fast as they could ; most of them because they were in debt, and could not get away from there with anything that belonged to them.

Q. Was that due to the agricultural depression ?

A. Yes. They missed the crops there for six or seven years in succession down in South Dakota and Nebraska.

By Mr. McCreary :

Q. To whom did you send your list of immigrants ? Did you report to the Commissioner's office at Winnipeg, or to the head office at Ottawa ?

A. I reported to the head office at Ottawa.

Q. You did not report to the Immigration Hall at Winnipeg ?

A. No.

By Mr. Wilson :

Q. Was there an immigration hall there at that time ?

A. I think there was, but I had no instructions to report to Winnipeg.

Q. The party in Winnipeg, who was in charge of the immigration there, had no jurisdiction over the agents in the United States ?

A. No, I think not. There was a short time, I remember, I think that it was in 1894, we were ordered to report to the commissioner at Winnipeg ; that was the time that Mr. Campbell sent in his resignation, and we were ordered to report to the commissioner at Winnipeg, but that only lasted for a short time, and then we were ordered to report to the department at Ottawa.

By Hon. Mr. Fisher :

Q. When your work came under the Department of the Interior, did you still report direct to the Minister ?

A. No, I reported to the Deputy Minister.

Q. Direct to the Deputy Minister, or to the head officer of the immigration works in the United States ?

A. Yes.

Q. In 1894, you said, or in '93, that there were about twenty-four agents in the United States?

A. Well, I think there fully that many.

Q. Then I think you said they were reduced afterwards, in 1895 or 1896 ?

A. At least half of them were laid off in November, '93, that is my recollection.

Q. Were they put on again in '94 ?

A. No, they were further reduced, in '94 I think there were seven or eight altogether.

Q. Do you know what that deduction was due to ?

A. Well, it was claimed that they had no money in the Department with which to pay them.

By Mr. Wilson :

Q. Was that the result of the general hard times ?

A. I suppose so.

By Hon. Mr. Fisher :

Q. Of course the money was not there because the vote was not taken ; did you understand there was any complaint as to the method or system that was pursued, that it was not a successful system? Was that the reason the reduction took place?

A. No. I did not hear anything of that at all; I heard nothing in regard to the result of the work, other than that the Minister was satisfied with the amount of the work done by those employed ; that was all, and that I got, I think, verbally.

Q. There was no difference or change in the instructions you received from the Deputy Minister of the Interior, unless later, or was your work continued as long as you were in the Department along the same lines and in the same way?

A. I do not remember there was any change in the instructions; the idea was, I was to go wherever I learned there was in any way depression in the United States and to distribute literature and appoint agents on commission.

Q. I suppose in these later years there was a great deal more depression in the United States than there was in the first years ?

A. No, they had a good crop, I think it was in 1893, in Dakota and Nebraska ; at least it was called a good crop, they averaged between seven and eight bushels per acre, which was something more than they had before.

By Mr. McCreary :

Q. In addition to the Canada Settlers' Company, do you know of other settlers' companies, so called, operating in that district ?

A. No.

Q. Did you ever hear of the York Farmers' Colonization Company ?

A. Not in connection with the work I was doing ; I heard there was such a company, but they were not connected with my work at all.

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Q. Do you remember Mr. Duncan Livingston, a hardware merchant at Yorkton at one time.

A. I remember there was such a man at Yorkton.

Q. Do you know Mr. Ballinghard, the Dominion Land Agent at Yorkton?

A. No. There was no such man as Dominion Land Agent when I first went to Yorkton.

By Mr. Ross (Ontario) :

Q. Did you take any settlers into the Prince Albert section ?

A. Yes.

Q. How did they do in there ?

A. I understood they did very well ; I placed some forty families in the Carrot River section, and fifty or sixty families up in the Swan River section.

By Mr. McCreary :

Q. In 1891 ?

A. Yes, in '91 and '92.

Q. Well, I was up there in '91, and there were none in there then; how did they go in ?

A. There was no railroad there, and they drove in and I accompanied them in their drive across from the railway for some seventy or seventy-five miles. The district I mean is south-east from Prince Albert.

By Mr. Davis :

Q. That is out towards the Quill River district?

A. Yes, in that direction.

Q. That is in the Shoal Lake?

A. Yes, that is the place ; I discovered that section and took the first settlers out there.

By the Chairman :

Q. That was the first settlement from the United States ?

A. Yes.

By Mr. McCreary :

Q. There was the Fish Lake settlement. Did you know anything about that?

A. Yes, I took them up there from Michigan.

Q. Did you know they had all left the country ?

A. No, they were all there when I left the work.

Q. There was a German settlement, the 'Ebenezer settlement,' as they called it, in there from Yorkton some 30 miles I think, do you know anything about that ?

A. No, I had nothing to do with that.

Q. Do you remember Jacob Wortz; he was the last one left there, I think?

A. Did they come in from Indiana ?

Q. No, they came in from South Dakota ?

A. I had nothing to do with them. I brought a German colony up from Indiana ; they called themselves—I forget, they were some religious sect—the Dunkers. I brought up a colony from Indiana near South Bend.

Q. Where did you put them ?

A. I took them up into the Buffalo Lake country, between Calgary and Edmonton, or east of there.

Q. How many did you take there ?

A. My recollection is that the party who went up with me consisted of twenty-two families, but they entered for and represented over 100 altogether. I do not know exactly how many went there.

Q. You do not know what took place in that colony, or the results, do you ?

A. No.

By Mr. Ross (Ontario) :

Q. Is that the only colony you took up into the Edmonton section ?

A. No. I took up two or three parties, from Michigan, and big parties from Nebraska, and they settled at Olds, which had a tank and nothing else at that time. These parties were bound to stop there ; they looked the country over and said it was good enough for them ; I told them it was dry there at times, and advised them to go further, but they said they would stay there and thought it would suit them. They brought plenty of money with them.

Q. They were foolish ?

A. I thought so ; I wanted them to go further north, but they would not.

By the Chairman :

Q. Might I ask if any of your agents had anything to do with the settlement of Theodore, a settlement of Danes north-west of Yorkton ?

A. Yes. Well that was known as Theodore at that time ; it is on two little lakes the place you refer to ?

Q. Yes.

A. George Hill, the agent for the Government, or locater or something of that kind, was the one who advised them to stay there. Frederick Oleson and one or two others were among those who settled there.

By Mr. McCreary :

Q. About those Dunkers, how did you come in contact with them in Indiana?

A. A letter was written to the Department and turned over to me from some reverend among them—my recollection is that he was in Pennsylvania—at all events, had his address and I went down there to see him, and he gave me one or two other addresses of reverends in Elkhart, Indiana, and I went there and gave them some information.

Q. Did you assist them ?

A. Yes.

Q. In what way ?

A. Do you mean money ?

Q. In any way ?

A. Only to give information, and I took up two or three representatives for them ?

By Hon. Mr. Fisher :

Q. You have these records ; is there anything you wish to inform the committee about ?

A. Unless I am asked about them I can only give the records as I gave them to the department at that time.

By Mr. Ross (Ontario) :

Q. You cannot add anything new to that ?

A. I do not know now what is in them. I have just glanced over the volumes to see that my reports are in, but as to their actual tenor I have not refreshed my memory.

Q. What is your present business, Captain; you have been a lake captain?

A. I have been a lake captain, but just at present I am not in any business.

By Mr. Wilson :

Q. Can you give the States you worked in or generally, and about what years?

A. I can do that from memory. I established agencies in North and South Dakota, Nebraska, Illinois, Michigan, Iowa, Kansas, Washington, Oregon, Idaho, Montana, Ohio, New York, Kentucky, Missouri, Utah, Colorado, California ; in all

these States, I put in, or I got some one to work on commission, distribute literature, and I sent it to him.

By Hon. Mr. Fisher :

Q. The agents were on commission ?
A. Yes.

By Mr. McCreary :

Q. What commission did you pay, Mr. Holmes ?
A. Five dollars for each family when the homestead was made.

By Mr. Ross (Ontario) :

Q. Did you ever have any trouble in regard to doing such work ?
A. No one ever objected. The Dakota papers used to give us Hail Columbia for trying to take people away, but they gave up after a while.
Q. No official notice was taken of your work ?
A. No.
Q. Would you be in all these States in one season?
A. I think I was in all in one season, but perhaps not quite all. I know after we got the agencies established I did not visit all. I know I did in 1904.
Q. Did you have an agency in each State?
A. A commission agency.
Q. A commission agency ?
A. I know in 1893, we had a man in Wisconsin—that is another State that I overlooked—a government man ; and we had a man in Minnesota, a government man ; one in North and one in South Dakota, three in Michigan, one in Illinois, two in Nebraska, and I think two in Kansas. I have forgotten just exactly the different numbers.
Q. In the neighbourhood of fifteen or twenty ?
A. That many anyway.
Q. And commission agents under them ?
A. Yes.
Q. About how many ?
A. I think perhaps about one for each agency.
Q. That was in 1893 ?
A. That was in 1893 and in 1894 we left them.
Q. And what was the immigration from the United States to Canada in 1893, according to your return ?
A. I think my returns showed between 3,000 and 4,000.
Q. That is, your individual work ?
A. That and of those under me.
Q. Had you assumed control then ?
A. Yes, I assumed control in 1893.
Q. And it was between 3,000 and 4.000 in 1893 ?
A. Yes.

By Mr. Stephens :

Q. And that was the total from the United States?
A. As far as I knew anything about. As to New England, I did not know anything about that.

By Hon. Mr. Fisher :

Q. You had charge in the United States west ?
A. Yes, not in the east.

By Mr. Ross (Ontario) :

Q. Were you getting much immigration from the Eastern States ?

A. I only know from Mr. Swanson's reports. There were two parties in the Lowell district I went down to see, and I advised leaving them off, as soon as I got down there and looked over their work.

Q. Why ?

A. Because it was a factory town, and the people there were engaged in the factories. It was not a question of getting the men only, but there were the women and children as well, and when a man had five or six children, perhaps three or four of them girls, working in the factories, you could not pull them out of the country with a logging chain.

Q. So there were none ?

A. None, and I advised the Department of the Interior to stop the expense there at once, and I think they did.

By Mr. Blain :

Q. I suppose a large number came over ever year besides those you brought ?

A. Yes, I think so. From my indirect efforts I should say there were lots who did come, no doubt who, by my efforts direct, I did not bring in.

Q. Those who came by your indirect efforts would not be in your account ?

A. Not any further than I might refer to them in my report, as families I knew had gone up from where I had worked.

Q. What salary did you receive ?

A. $1,200 a year.

By Hon. Mr. Fisher :

Q. The number you gave in answer to Mr. Ross included all you had reason to believe came, direct or indirect ?

A. No. There would be a few more.

Q. There would be a few more ?

A. Yes.

Q. What is your estimate ?

A. I should say, judging from what Mr. McInnes and Mr. Webster used to tell me, there would be some 200 or 300 more families go up, than we gave.

By Mr. Blain :

Q. You would think from the general movement of immigration from the United States west to Canada, I suppose, that there would be constant immigration from the United States into Canada in these years?

A. Yes, probably an average of five or six families a week anyway.

By Mr. Davis :

Q. And five or six going out ?

A. That I kept no track of.

By Mr. McEwen :

Q. Was there any way of crossing the line without you knowing ?

A. They could not cross and bring anything without having a record made of them, because the Customs would catch them. I know of my own knowledge of twenty families who drove over and went into Killarney or Deloraine, they went to either one or other place and made an entry of their stock and their families went up afterwards by train.

Q. Would these be in your report ?

A. Yes.

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By Mr. McCreary :

Q. As a matter of fact, the agent of this land company went with you to Dakota ?

A. Yes.

Q. And operated with you ?

A. No.

Q. Mr. Campbell, in his report here, says that early in May you arrived in Winnipeg with a large party from South Dakota, which he had photographed, and that after their arrival they kept coming until about the first of September, when it was decided to make a big push that fall. That was September ?

A. Of what year ?

Q. 1891. He goes on to say, 'arrangements were made with the railway companies for cars, and about the latter part of September the first party arrived in Winnipeg; others followed in large and small numbers from day to day up to the end of the season.' That is the party he photographed. Then he says that yourself and Mr. Webster, Mr. Pettit and Mr. Smith, on behalf of the Canada Settlers' Land Company, went down to bring these people up ?

A. Well, that is not exactly correct, because Mr. Smith was down there in April, 1891, in the first instance.

Q. And he was also down there in September ?

A. Well, he may have been in September, that I do not know, because I was not there. I was in Michigan.

Q. Then Mr. Campbell's report is not correct when he says that you and Mr. Webster and Mr. Pettit and Mr. Smith went down there together ?

A. Well, afterwards I went away. I was not there when Mr. Smith came down in September, that I am positive of. I might have been in Kansas or Michigan.

Q. The difficulty with this Canada Settlers' Land Company was that they took a lien on settlers' land and effects, and if there was a bad season there was no chance to redeem his farm. If you look at the records of the department, you will find letters from men who said they could not raise the mortgage. The consequence was that these people left and went to Washington and Oregon ?

A. Of course, I do not know anything about that.

Q. I wrote to the Minister at that time to see if these people could not be allowed to buy another 160 acres at a cent an acre to avoid this clause in the land company's contract ?

A. That I know nothing of.

By Mr. McEwen :

Q. What time did you pay these agents their commission ? After coming across, or when the settlers were on the land ?

A. After the certificates were turned in by the Department, we issued the certificate, if I recollect aright—I have just forgotten the exact transaction—but I think there was a certificate issued to a settler going across and filed with his application for land, and these came into the commissioner's office and came into our hands and we paid the agents on these.

Q. Five dollars a family, not apiece ?

A. Yes, $5.00 a family.

Q. No matter whether large or small ?

A. No. We paid on homesteads.

Q. But they were not on homesteads when they put in the certificate ?

A. But the agent didn't get paid till they were on the homestead, then the certificate went into the land office and we paid them on that.

By Mr. Wilson :

Q. You say they did not get paid until the immigrants made the entry and settled on the land ?

A. No, that is the way.

By Mr. Ross (Ontario) :

Q. How long would that be, Captain, after the time of leaving home?

A. Usually from Nebraska, which would be about half way, it would be about five or six days at the outside till they made the entry, and it would take a week or ten days for the papers to get back again.

By Mr. Wright :

Q. Do you know what interest the land company charged ?

A. Six per cent, I think it was.

By Mr. Wilson :

Q. That would be quite moderate at that time?

A. It was not high. These people had been paying 12 per cent in Dakota, and that was the view they took of it.

Q. You take the view then that you were laying the foundation of the present immigration work in the United States ?

A. That is what I claimed and still claim. I think we were laying the foundation.

By Mr. Stephens :

Q. A very bad foundation, if the people all left ?

A. But the building stood.

By Mr. Wilson :

Q. Do you know what interest they are paying out there now ?

A. No.

Q. Mr. Webster worked with you a good deal? In what year did he die?

A. In the summer of 1895.

Q. He was a very energetic agent ?

A. Yes, he was the one who first started the immigration business in 1886-87-88.

Q. And he distributed a great deal of literature ?

A. Yes, through North Dakota principally, but he was in South Dakota as well.

Q. If I remember rightly, Mr. Webster did a good deal in Ontario, in distributing literature to prevent people going to the United States ?

A. Yes, he used to go back and forwards and hold lectures in different places and distribute literature.

By Mr. Wright :

Q. In Ontario ?

A. In Ontario, yes.

Having read over the preceding transcript of my evidence, I find it correct.

ALFRED P. HOLMES.

ADMINISTRATION OF DOMINION LANDS

HOUSE OF COMMONS,
COMMITTEE ROOM 34,
THURSDAY, June 18, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10.30 o'clock, Mr. DOUGLAS, Chairman, presiding.

Mr. John G. Turriff, Commissioner of Dominion Lands, was present by request of the Committee and was examined as follows:—

By Mr. LaRivière :

Q. Mr. Turriff, I understand you are the Commissioner of Dominion Lands ?
A. Yes.
Q. How long have you held that position ?
A. Almost five years.
Q. Almost five years. You succeeded Mr. H. H. Smith?
A. No, I succeeded the late Mr. Burgess, who succeeded Mr. Smith.
Q. Is there much work left with the Commissioner with regard to the adjustment of claims under the Manitoba Act ?
A. Yes.
Q. That is part of your work?
A. Part of my work, yes.
Q. You look after the unpatented land along the old settlement roads, along the Red river and the Assiniboine and the other settlements that are under the Manitoba Act ?
A. Yes, practically everything in connection with lands come before me.
Q. Are there many of these lands, of these river lands, unpatented yet?
A. There are quite a number that have been—these lands are not open for homestead entry, they are disposed of by sale, and there are quite a number that were squatted on many years ago, and the parties on the land simply won't make the payments, and we cannot dispose of them to any person else, because these squatters are living there.
Q. These are not under the Manitoba Act ; I refer to those occupied at the time of the transfer and that have since been claimed or applied for, for patents?
A. Well, there are a few of those.
Q. There are very few of them ; and those that are left, where are they generally, above or below Winnipeg ?
A. Well, I really could not say. There is only very occasionally one of these comes before me, and I usually have Mr. Cote, who is the best posted man in regard to all these claims, come down and we discuss the matter and come to a decision. I am not prepared to say off-hand whether the majority are north or south of Winnipeg.

CLAIMS OF LAND SQUATTERS.

Q. Do you know anything about the trouble in the parish of St. Peters in regard to the claims of squatters or settlers there who have been in occupation for the past

fifty years, and the Indian title, because that is a part of an Indian reserve ; do you know anything about these troubles ?

A. Well, very little. The matter was taken up some years ago, and Mr. Rothwell, the law clerk of the Department, went fully into every individual case, and he reported that these applicants or claimants had no grounds to base a claim on.

Q. Have you given, or are you aware, whether any patents were ever asked for ?

A. It has only come up on one or two occasions. Only on one or two occasions has it come before me, and I always noticed the matter had been gone very fully into by Mr. Rothwell, and he says there is no claim.

Q. Do you know as a matter of fact that many of these people are in possession of these lands, and that these lands were in possession of their fathers for fifty years ?

A. I do not know that as a fact, I do not know that they are residents on the land.

Q. And that report of Mr. Rothwell's is not open to examination ; is it public or merely for the private information of the Minister or yourself ?

A. No, it is just the same as any report. There would not be the slighest objection to showing it to any one.

Q. Would there be any objection to publish it in your report so as to let people know the opinion of your law officer ?

A. They have all been notified.

Q. The interested parties have all been notified ?

A. Yes.

Q. The government has sold some of that land around St. Peters ?

A. We have sold some around Selkirk.

Q. You do not know whether it is part of that ?

A. I do not know whether it is part of that claim.

Q. You could not give the names of the purchasers ?

A. No.

Q. What are your other duties in connection with this phase of immigration ; you have nothing to do with immigration, I suppose ?

A. Nothing whatever to do with immigration.

Q. And what else have you to do with lands ?

A. Well, I practically have the administration under Hon. Mr. Sifton and Mr. Smart, of all land matters, though anything in the way of a snarl comes first of all to me.

Q. All applications for patents ?

A. All applications for patents ; I have to sign the application if it is approved, and sign the recommendation for a certificate ; I do all that.

Q. Then, do you have anything to do with the sale of land by ordinary sale, or only in connection wih land taken for ordinary homesteads ?

A. Well, I have to do with anything in the way of ordinary sale that is done. I might state, perhaps, to the Committee that until about three years ago the practice of the Department was that when anybody asked to purchase a quarter section their applications were granted. Up to that time there was little application for the purchase of land. Two or three years ago applications began to increase very much, more in connection when that half breed cash scrip was issued that they could purchase the scrip and then the land. There were so many applications coming in that after discussion with the Minister and the deputy we decided it would be more in the interests of the country to do away with general sale of lands. We decided only to sell to farmers, but the applications increased very fast and we shut that off, so that at the present time the lands are held for entry by actual settlers. But it is not an absolutely hard and fast rule, because it cannot be made that. There are dozens of cases where a farmer has lost his homestead through a mortgage to a loan company or something in that line, and there is a piece of government land near him. In these cases we sometimes allow the man, where he is not entitled to a second homestead, to purchase at $1 an acre and homestead duties, and often, say if he has missed getting his homestead

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through a technicality, by being a week short in residence, or where under the Act you cannot allow him a second entry, we allow him to purchase a quarter section with homestead conditions attached, or may be a little patch near him that no one will take up. We use our discretion, but generally give a man in that position a chance.

Q. Any information you have to give about the management of the Dominion Lands Department will be interesting ?

A. I will be quite willing, but I hardly know what line to follow. I must depend on your questions.

Q. Have you anything to do with the dealings the government has to do with these immigration companies, or colonization companies so-called ?

A. Yes.

Q. Would that take part of your time ?

A. Yes.

SALE OF LANDS TO THE SASKATCHEWAN VALLEY LAND COMPANY AND CONDITIONS OF SALE.

Q. That sale was made by the government to a certain company, the Saskatchewan Valley Land Company, of 250,000 acres of land, at what price was it sold ; Mr. Smart said you would know ?

A. It was sold under colonization conditions. The terms were that they applied to buy 250,000 acres at $1.00 an acre, and the agreement, arrived at after some consideration, that they would be allowed to purchase 250,000 acres on condition that they put in 20 homesteaders, on free homesteads in each township, and put in an additional twelve settlers on the even numbered quarter sections, that they had the privilege of buying, making 32 settlers in each township. Then they would have the privilege of buying the balance of the even numbered quarter sections in that township at $1 per acre after they had fulfilled these conditions. They put up $50,000 as a matter of good faith, which stands as a final payment. In the meantime they have to go on. They have five years to complete the arrangements, and two-fifths of the work must be done in the first two years.

By Mr. Boyd :

Q. Are there many of these companies ?

A. Only one.

Q. Is that a new arrangement of the Department, or is it some new rule that has been adopted, or is it a conformity with the regulations of the Department heretofore, or the Land Act ?

A. Well, of course the Minister has authority under the Dominion Lands Act to do that, and it is not following—it is somewhat on the line of the policy formerly pursued in connection with colonization companies, although the details were nothing similar,—but it is not following in the line of the policy adopted in the Department at the present time, because there has been no other sale made, although there have been many applications. I might, perhaps, explain to the Committee that this was done on the recommendation of the outside officers of the Department. I brought a map over with me, and if it would be any advantage, I might hang it up, and let the Committee see just where these lands are.

Q. Better let us have the map.

A. That concession was marked within the red outline which is marked on the map, and I may say that the bulk of that land was surveyed about 20 years ago. The railway from Prince Albert to Regina had been running through that stretch of country ten or twelve years, from some time about 1890 or 1891, and from the time the land was surveyed twenty years ago until 1902, last year, there were only three homestead entries made in all that stretch of country, practically from North Lumsden, on the Qu'Appelle river, up here towards Dundurn, near Saskatoon. It was looked on as being absolutely useless, settlers would not come in at all, and these parties

made the proposition to settle up that part of the country, and it appeared to be a pretty good proposition. We get 32 settlers in each township, and a dollar an acre for the land.

By Mr. Robinson (Elgin) :

Q. What company is this ?

A. It is the Saskatchewan Valley Land Company now. Half a dozen men made the application, the principal man being Col. Davidson, of St. Paul; another gentleman was Mr. Howe.

Q. It was an American company ?

A. I think about five Americans and two Canadians.

By Mr. Wilson :

Q. How much land was there ?

A. They have a right to 250,000 acres.

By Mr. Heyd :

Q. How many townships will that be ?

A. There is about 10,000 acres of even sections in a township; there are about 75 townships in the area which they could use.

By Mr. Ross (Ontario) :

Q. What is the quality of the land there ?

A. I think some of the land may be good, but a few years ago it was considered absolutely worthless.

By Mr. Boyd :

Q. What land was it? Was it held by any other company before, or was it just simply upon government land ?

A. The even sections were government land. The Qu'Appelle, Long Lake and Saskatchewan Railway Company, that is the Regina and Prince Albert line, had the right to select 1,500,000 acres, which they had earned in the odd sections along the line there. They selected between 300,000 and 400,000 acres, and they absolutely refused to take another acre. They had three or four different inspectors go over the land, examine it section by section, and they absolutely refused it, and said they were entitled to land fairly fit for settlement. We had an inspection also, and our inspection showed that at that time even our own men considered a great deal of it very inferior land, but they reported it more fit for settlement than the railway company's inspectors had done.

By Mr. Wilson :

Q. They have changed their opinion since ?

A. They have.

By Mr. Boyd :

Q. These are the lands that company refused ?

A. Yes, the company refused to take these lands, and they entered a suit, and it was in the courts here for a year or two; the company endeavoured to make the Government pay them cash, as they (the government) could not give them lands fairly fit for settlement. The government offered the company the right, not only to select in that particular grant that had been set apart for them, but to select any available odd sections in Manitoba or the North-west Territories that were at the disposal of the Department.

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By Mr. LaRivière:

Q. Even in Manitoba?

A. Yes. There was not much in Manitoba, but they were offered that to give them an opportunity to get their land grant, and they said they could not get it.

By Mr. Boyd:

Q. They refused it?

A. They refused it.

Q. The Saskatchewan Valley Land Company did not get as favourable a proposition.

A. I do not understand you, Mr. Boyd.

Q. You did not submit that same proposition to this company, that is the permission to take any lands?

A. You mean the Saskatchewan Valley Land Company?

Q. Yes.

A. No. When they purchased the railway land grant, the same company purchased the railway land grant that were given the 250,000 acres, and when they purchased it they expected to get the same choice, but we restricted it very much.

Q. Are there settlers going in there now?

A. Yes, very fast.

Q. And they are accepting the lands?

A. I am not prepared to say just how many have gone in on their grant, but last summer there were over 300 homestead entries made in that concession last year. They had gone in under the colonization scheme, and I know they have put in over a thousand settlers outside of their colonization scheme altogether, for whom they get no credit.

By Mr. Wilson:

Q. In what length of time?

A. In a year.

Q. One year?

A. Yes, over a thousand. At one time we had over 700 applications up here between Quill Lake and Prince Albert.

Q. All these people applied for homesteads?

A. They all applied. Some had already got homesteads in the townships surveyed, but we had at one time seven hundred names of applicants for homesteads in townships along here which were surveyed last fall. Many of them had been surveyed last fall, but the plans had not been completed.

Q. Do you insit when you grant a man a homestead that he shall live on the land?

A. In the Act, six months are given after entry to go into residence, and the policy we have adopted is where the six months come in the fall, for instance, if a man makes entry this month, and the end of the six months comes in the fall, and he applies stating it is not convenient to go into residence in the fall, we grant an extension.

Q. I was thinking about the Barr colonists. It could hardly apply to them.

A. In that case they were told they would not be compelled to go into residence if they did not wish, until next spring, that is into actual residence.

By Mr. LaRivière:

Q. Do you mean free homsteads?

A. Yes, I am not talking now about the colonization scheme. These were settlers that the Saskatchewan Valley Land Company have had in connection with the sale of their railway lands, it is outside of their colonization scheme altogether, and they get no credit for this.

Q. What benefit is it to them to colonize outside of their reserve?

A. You see they bought the odd sections from this railway company.

Q. And it is to enhance the price of their lands.

A. They can make a better price naturally in selling to a man a quarter section they have purchased from the railway company, if they could assure the man that he could get a free homestead in the vicinity.

Q. How could you credit that company for having brought these immigrants in?

A. They do not get any credit at all.

Q. Then it is not the company that is locating these immigrants there.

A. Yes, the Saskatchewan Valley Land Company has taken these settlers in there, but they get no credit for it in connection with this colonization scheme, but they do it simply as a matter of business. They own the odd sections which they bought from the railway company, and they are selling the lands to actual settlers, and it is an inducement when they can assure them that there are free homesteads in the vicinity.

Q. But your Department and the Immigration Department are working to bring these people in ?

A. Yes.

Q. They are helping them, that is to say, the company may be helping the Government ?

A. Yes, they certainly are doing a great deal.

Q. You said that they are bound to settle twenty homesteaders. Was your land sold under homestead regulations ?

A. There must be twenty quarter sections in each township left available for free homesteaders.

Q. In each township, of course, there is the school reservation and the Hudson Bay Company's reservation.

A. Any outside of these. Of course care was taken to protcet the rights of any 'squatter' that might be found in the land.

Q. The railway company that had the selection of lands in that district did not get any and sell them to that company ?

A. No, they did not select much down there. They had selected some. They made a sale of 128,000 acres to some English company, known, I think, as the Land Investment Company or something like that, and these people evidently had never looked at the land, because they took very poor land, and the Q'Appelle and Long Lake Railway Company insisted that although they accepted this 128,000 acres as they had sold it, still they did not recognize it as land fit for settlement.

Q. Don't you think that is a very small proportion, twenty quarter sections? There are 128 quarter sections available in each township ?

A. No, sixty-five, only the even number sections that are open to homestead entry.

Q. You have not thrown open other sections than the even ?

A. No.

Q. What did you do with the others ?

A. The railway company have the right to select these. They have 1,500,000 acres to select.

Q. When the twenty homesteads are settled, what becames of the rest of the section ?

A. They put the twenty homesteaders on free homesteads in each township and an additional twelve on lands bought from us, making 32 actual settlers in each township. When they have done that they will be entitled to purchase the remainder of the even numbered sections.

By Mr. Wilson :

Q. At what price ?

A. At one dollar an acre. Then they have the right to choose the odd numbered sections in connection with their purchase from the railway company. If they do not choose the odd-numbered sections these will fall back in the course of a year or

two to the Government, and then it will be a matter of decision what shall be done with them.

Q. It will be a matter of a law suit, I suppose?

A. No.

By Mr. LaRivière :

Q. They have to understand they will get this?

A. They have the right to get all the odd-numbered sections, and as to what is left after the land grant is satisfied it will be a matter of decision on the part of the department or the minister as to what disposal will be made of the remainder of the odd sections, whether they will be thrown open for homesteading, or sold, I cannot say.

By Mr. Boyd :

Q. How many years have you given these people to carry out that arrangement with regard to the settlers ?

A. Five.

Q. Five years in which to put on these settlers in accordance with the agreement they have made ?

A. Yes, two-fifths of it must be done in two years.

Q. What is the penalty if they do not ?

A. They forfeit the fifty thousand dollars we hold.

Q. And what about the land ?

A. They do not get any patents until they have fulfilled all the conditions ?

By Mr. LaRivière :

Q. What about the settlers who had squatted or settled on this land? in what position would they be supposing you cancelled the arrangement with the company ?

A. The twenty would be on the free homesteads anyway.

Q. They would be all right ?

A. Yes, and if the company did not get the land and they settled on it they would eventually get a homestead on it. From the way the company is going on, I imagine they will carry out the conditions.

By Mr. Wilson :

Q. You said they brought in one thousand last year and this year. Where were these from ?

A. Largely from Minnesota.

Q. Then their own effort has done that ?

A. I will not say it is all through their own effort, but it is largely their own effort.

Q. Practically you would say they did it ?

A. They came in under their effort and protection. Of course, I am not posted in immigration work, and I am not prepared to say what proportion came in through their effort and what through the efforts of the immigration agents.

Q. Well, but you would say so ?

A. That the Immigration Department did not have anything whatever to do with it ?

Q. You could not say that, or that the land companies had nothing to do with it?

A. No.

Q. Or that the Canadian Pacific Railway did not have something to do with it ?

A. No.

Q. They all work together, I suppose ?

A. I can say this, that for ten years the Canadian Pacific Railway has been running through there, and only three homestead entries had been made.

Q. That may be, but you know the Deputy Minister said the advertisement after a time even does good work ?

A. Yes, that is right.

Q. Do you know whether the agents of the Government who are working in the United States on commission get any commission on these immigrants?

A. I do not know anything about it.

Q. What is your opinion ?

A. I do not know anything about it; I would not like to express an opinion.

Q. I am of opinion they do, myself.

A. I could not say.

By Mr. Sproule :

Q. I understood Mr. Turriff to say a certain portion of the land that was not sold, which would be the odd-numbered sections, the even-numbered sections being open to homesteading, after a time would fall to the lot of the Minister of the Interior, to say what disposition should be made of them, whether sold or thrown open to homesteading, do you think the Minister of the Interior has any power to determine what shall be done in a case of that kind ?

A. It may be a matter for parliament. The idea I was wishing to give was that in all these immense railway land grants there is a much larger area of the odd sections set apart than is due to the companies actually, because they have the right of selection, but we are gradually getting them cornered up, and when we get through with the railway land grants, there is going to be a lot of odd-numbered sections that are at the present time reserved from being dealt with by the Department, until the railway companies get through, and when they are through these odd-numbered sections that are not taken by them will be open for the Department to deal with in some way.

By Mr. LaRivière :

Q. There were some colonization companies organized in former years ?

A. Yes.

Q. And they had some land set apart for them, but I do not think any of them ever met with any success ?

A. Not a great deal of success, any of them. I think they all more or less lost money; but they have all closed up their dealings some years ago, and some of them got a considerable amount of land, and I imagine that they are getting the increased value now.

Q. Are there not some that are still in existence?

A. That is they closed up their dealings with the Government and got so many thousand acres of land that they were entitled to, and they have been disposing of their land from time to time.

Q. When this colonization company was first organized you say that you did not deal with them, you told us that it was first of all the individuals that applied.

A. Yes.

Q. And then these individuals organized this company, or this company was organized independently of their efforts, or what?

A. I imagine that these individuals who made the purchase are the same individuals who made the purchase from the railway company, and they organized into a company under the title of the Saskatchewan Valley Land Company, as I understand it.

Q. But do you know?

A. Well, I practically know; Col. Davidson told me so.

Q. You are not directly interested yourself in that enterprise, or were you ever interested?

A. In the Saskatchewan Valley Land Company?

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Q. Yes, or with the individuals?

A. No, not in any shape or form. One of the applicants is Mr. A. J. Adamson, Rosthern, who is my brohter-in-law, but that is no fault I think.

Q. There is no one, or he does not represent your interests or the interests of any servant of the government?

A. No, not for me, and as far as I know, not for anyone else.

Q. Of course I am putting this question to you, because it is rumoured more or less that some of the officials of the Government are interested, but that may be trumped up by interested parties in different directions, but it is a rumour that some officials of the government, including yourself, were not disinterested in that land grant that was made by the Government. I hope it is not true.

A. It is not true. I may say that the arrangement was made with Mr. Smart, and the agreement was made in my absence, and I knew nothing about it.

Q. You say that the arrangement was made and you had nothing to do with Col. Davidson, of Minneapolis, in respect to that matter.

A. Not until after the arrangement was made.

Q. Not until after the arrangement was made?

A. Not until after the agreement was arrived at.

By Mr. Boyd:

Q. Has this company any land, or have they received any land from the Government outside of this land of the Regina and Long Lake Railway Company; have they lands under that arrangement in any other part of the province?

A. No.

Q. You understand yourself, Mr. Turriff, that these were pretty favourable conditions, a dollar an acre, if the lands have any value at all; and it is said that they have lands in districts entirely outside of that grant that the Regina and Long Lake Company refused. You should know whether that is true or not.

A. Yes, I do; well, I have it here, just exactly, and I can make it just as clear as possible. I will explain it on the map. The Regina and Long Lake Railway land grant originally was covered by these two blue patches, and these blue patches down here. Then afterwards, as I stated a little while ago, we gave the Regina and Long Lake Railway Company the right to select not only in these two districts, but all through here, and here, and through this stretch of country, and in part of this down here; also anything that was available in the odd sections, that were available in any part of Manitoba and the North-west Territories at that time.

Q. When was that?

A. That was about four years ago, I should say, it was when they were going into the law suit.

Q. Was that the time they refused the land?

A. Yes, when they said they could not get land in there we said: 'We will allow you to go outside that, and select anything in Manitoba or the North-west Territories that is available.' They had that right at the time they sold to the Saskatchewan Valley Land Company, and when they came to have that sale carried out, the land company wanted to have that same right of selection, but we restricted them, we allowed them of course to select along the road, in these two patches. We do not think ourselves, from the reports that we have received, that they could get the required area surrounded by brown here on the map, this piece here, while in this piece here, I doubt if they will take 5,000 acres, but they wanted it, and I did not see any objection to letting them have it reserved.

By Mr. Ross (Victoria):

Q. What was the result of the law suit?

A. Well, it never came to trial, it was in hand hanging fire for a year or two, but this agreement simply settled it up.

By Mr. Boyd :

Q. Then they have the right to select land outside that area ?

A. Well, they have the right to select in this piece here, and in that, in addition to the blue patches.

Q. Well, it is not really the lands that the company objected to ?

A. Yes, the company had the right to select in all that, and in all that, and in the whole country besides, that was the railway company had that right; this company have not the right to select one acre that the original company had not the right to select.

By Mr. Wilson :

Q. I understood you to say that you restricted them to certain areas ?

A. They are confined to that blue mark, and that, and that (indicating on the map).

By Mr. Boyd :

Q. Was it not that particular spot along the line of the railroad that the railway company refused to accept ; was not that what the government held them to the acceptance of ?

A. No, they had the right to select there, and there, and there, and there, (indicating on the map), and over the whole country, and they selected between 300,000 and 400,000 acres of it, and then would not take another acre of it, and said there was not land of a character fairly fit for settlement there.

By Mr. Larivière :.

Q. That was at the time they were restricted to certain areas?

A. Yes. When we gave them the privilege of going all over the country they sent out three or four different inspectors, and went all over the outside land, and they refused to accept it.

By Mr. Boyd :

Q. Was not this company first confined to the land that they refused to select from ?

A. Yes, absolutely, and they have not got nearly as much as the railroad company had the right to select from.

By Mr. Wilson :

Q. Do you know of any other land companies that brought in settlers ?

A. Yes, I have no official knowledge, but I understand, for instance, that there was a company down here in the Moose Mountain district that brought in settlers.

Q. What do you call that company ?

A. Well, I do not know the name of it ; a man named Robertson was one of the principal men in it. I cannot think of the name, but they bought, I understand, 200,000 or 300,000 acres of land down here (indicating on the map), from the Canadian Pacific Railway Company, and they have resold them, and I understand have been assisting in the work of settling these lands.

Q. And they were quite successful, you admit ?

A. Well, I know that in that part of the country there has been a great many settlers gone in during the last year or two.

Q. How many would you say ?

A. I should say within the last two years in that land district, the Alameda district, which takes in township 10, I should say, speaking roughly, that between 4,000 and 5,000 homestead entries have been made there.

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Q. Well, that is principally due to the efforts of that company ?
A. I think they helped.
Q. Well, they largely helped, do you not think ?
A. Yes, I think so.
Q. I am sorry that you cannot remember the name of the company ?

By Mr. LaRivière :

Q. That company had no connection at all with the Saskatchewan Land Company ?
A. No. I think I might get that name for you, I will try, but you see we have had no correspondence with them as far as I know in any shape or form, because they got nothing from the Government, but I imagine I ought to be able to get hold of it.
Q. There are other companies also, I suppose ?
A. Yes.
Q. Can you give us the name of any of them ?
A. The Haslam Land Company.
Q. What have they done ?
A. I do not know, but I see they advertise lands for sale.
Q. How much have they ?
A. I have no idea, they got none from the Government.

By Mr. Sproule :

Q. Have you any knowledge of the number of colonization companies in existence ?
A. No, nothing more than in the Winnipeg papers you see quite a number of companies and individuals advertising lands for sale.
Q. Can you give an approximate estimate of the number of settlers they have put on the lands in that country, in these portions ?
A. No, I cannot distinguish at all as to who brought them in; I do not deal with that matter at all.

By Mr. Wilson :

Q. You will send me the name of that company ?
A. I will endeavour to get it. I think I have letters from one of their agents.

By the Chairman :

Q. It seems to me it is the Canadian American Land Investment Company, with headquarters office at Weybourne. They got 80,000 acres from the Canadian Pacific Railway, and I fancy it is very largely settled ?
A. Yes, that is the company.

By Mr. Boyd :

Q. You say that you have nothing whatever to do with the Immigration Department, nor with the direction of immigration to any particular district ?
A. No.
Q. You do not know for a fact that any of the energies of the Immigration Department are directed towards the settlement of this particular land grant that we have been discussing this morning ?
A. Not as far as I know, and I do not think so.
Q. Are you aware there are rumours ?
A. That our officials are——
Q. It is street rumour, and has been for some time, that certain officials of the department are interested in that company that we are discussing, and that the energies of the department or these officials direct incoming settlers to these lands.

A. Well, I do not think it is the case; so far as I know it is not, and I never heard it. Of course the great rush at the present time is not so much in that direction. They go west to Saskatoon. Saskatoon and Edmonton are the principal objective points this year.

By Mr. LaRivière :

Q. Do you know the names of the directors of the Saskatchewan Valley Land Company ?

A. No, I know some of them. Colonel Davidson is president, a man named Piper is treasurer, and a man named Douglas is vice-president. Douglas is the Quaker Oats man.

Q. What are the names of the subsidiary companies connected with the Saskatchewan Valley Company; some other companies connected with it, branches or interested in the same work ?

A. I do not know of any.

Q. You do not know at all ?

A. No.

Q. What was the company that had trouble with the Blairmore town site; the matter is now in court ? It would interest your department, and you ought to be posted on that.

A. There was not any company; it is an individual.

Q. An individual, not connected with any company at all ?

A. Not as far as I know.

Q. Well, what is the story in that town site trouble ? Who is the individual, to begin with ?

A. There were three applications to purchase the land, and each put in their evidence as to their rights.

Q. Can you give the names of the three applicants ?

A. Montelbatti and Lyons and Moffett.

Q. All people living there ?

A. Yes, all people living in the west; and according to the evidence it was thought that Montelbatti's claim was the strongest, and he was given permission to purchase the land. He purchased it and sold it. Then one of the other applicants took action, got permission to bring on a case in the courts, and it is in the courts yet.

By Mr. Robinson (Elgin):

Q. Where is that land situated ?

A. It is a piece of land up in the Crow's Nest Pass.

Q. Near mines ?

A. Yes.

By Mr. Boyd :

Q. Valuable because of coal mines there ?

A. I do not know.

By Mr. LaRivière:

Q. Are any of these men connected with the Saskatchewan Valley Land Company?

A. Not as far as I know.

Q. And do not represent the interests of the company?

A. Not as far as I know.

By Mr. Boyd:

Q. Do you say there is not a coal mine on the land?

A. I do not think so.

Q. What was the reason for the anxiety of these people to procure it?
A. Their idea was, I think, that it would become valuable for a town site property.
Q. I understood there was a coal mine.
A. Not in that valley, but you see there are coal lands on each side of it. There may be coal on that property also, but I do not know anything about it.

By Mr. LaRivière:

Q. Your information is that these three men were acting for themselves, and not any one else?
A. As far as I know.
Q. And if anyone would ask you if you were interested yourself you would say no.
A. Certainly, I would say no.
Q. Who are solicitors of the Saskatchewan Land Valley Company at Calgary and Winnipeg? Of course you have stated your brother-in-law is one of them.
A. What is it?
Q. Who are the solicitors of the company?
A. I do not know.
Q. Then you do not know whether Hector Mackenzie, of McLeod, is interested in that company?
A. He is not so far as I know. There has never been anything that would lead me to believe he is connected with it. I do not believe he is.
Q. Nor as a director or a shareholder?
A. Not as far as I know.
Q. We do not expect you to say anything you do not know.
A. He is not, from my knowledge.

By Mr. Robinson (Elgin):

Q. Does the Dominion government own any land in Manitoba?
A. Yes.
Q. Not under the province?
A. We own a lot of land in Manitoba.

By Mr. LaRivière:

Q. Do you know how much the company has paid the Railway Company for the land, for that land that they have purchased?
A. I understood they paid $1.75.

By Mr. Boyd:

Q. Did you introduce any new regulations since you came into the Department, or have you any suggestions to make for the improvement of the conduct of the settlement of lands since you have taken charge?
A. Yes, quite a number.

DEPARTMENTAL CHANGES IN THE HOMESTEAD REGULATIONS.

Q. Would you mind telling me what it is; what suggestions you have made or what improvements you have made in the Department?
A. Well, I could not tell them all offhand, but I could tell you some of the changes we have made; I think they are all improvements, naturally.

For instance, if a man is entitled to a second homestead, instead of forcing him to go and live on it, if his first homestead is in the vicinity near enough that he can live on his first homestead and do the improvements on the second, we do not compel him to live on his second homestead. That is one change that I call to mind. Or, if a man is the owner of farm lands for instance, he may take up a homestead and it may not be a

suitable place to build on, and if he buys a quarter section or becomes the owner of farm lands in the vicinity, we allow him to live on his farm lands in the vicinity, doing his improvements, of course, on his homestead. We also allow a man to substitute keeping cattle in lieu of improvements, where the land is not suitable for agriculture. A farmer's son is also allowed to live with his parents if they are living on farm lands in the vicinity of his homestead, not, of course, in a town or village. There are a good many other changes that have been made, all along the line of not being so technical as formerly, in enforcing the conditions of the homestead law.

By Mr. Stephens:

Q. Under what conditions does a man become entitled to a second homestead ?

A. If he had completed his duties entitling him to a patent for the first homestead prior to the 2nd of June, 1889, he is entitled under the present Act to a second homestead. The fact that he did not apply for a patent before that date does not affect the case if he had completed his duties before June 1, 1889.

By Mr. Wilson :

Q. But not since then ?

A. No.

Q. You cut that off ?

A. It was only in those cases I have mentioned that we allowed it.

Q. You do not allow them to take a second homestead now ?

A. No, not to-day. As a matter of fact, it was only those who went in somewhere in or about 1886, you see, who could be entitled to a second homestead.

By the Chairman :

Q. That is a cast-iron law ?

A. It is a cast-iron law. There were cases where a man missed fulfilling the residence clause—in those days a man could live within two miles of his homestead and have 40 acres broken, or if he had only 35 acres broken, these were cases where I always considered the man justified in purchasing a quarter-section at the minimum price, subject to fulfilling the homestead conditions.

CONDITIONS OF HALF-BREED SCRIP.

By Mr. Boyd :

Q. Would you mind telling the Committee the conditions of half-breed scrip as applied to land ?

A. Any land available for homestead entry can be located by a half-breed who has land scrip. He has to go personally to the office and make his location, and when that is done there are no other conditions; the patent issues to him.

Q. Any person can then get the patent from him ?

A. As soon as he has made his location he may dispose of it. He has, of course, to supply the sheriff's certificate and abstract of title and pay our fee of $2, and in that case the patent will issue to his assignee.

Q. What percentage, do you think, of half-breed scrip at present issued for land is held by half-breeds ?

A. There is not much held by anybody, I think, and I imagine what is held by half-breeds would be a very small proportion. I imagine that is so, but I have no definite knowledge. I know that half-breeds usually assign it.

By Mr. Kidd :

Q. They sell it out and out ?

A. They sell it usually about as soon as they get it. That has been the history of them.

APPENDIX No. 2

By Mr. LaRivière:

Q. Are you familiar with the work that is doing ?

A. Yes.

Q. Is the work of the commission finished now, have they concluded their work?

A. I know that they have concluded their work, and any cases they have not dealt with there are no means at the present time of dealing with.

Q. It is not the intention to reopen any of these cases ?

A. I am satisfied it is not the intention to reopen them.

Q. None were reopened since it was declared closed ?

A. No.

Q. Have you ever examined the reports and details of their reports?

A. No.

Q. Then, you do not know for a fact that there is a great complaint that they dealt with liberality in certain cases while in similar cases scrip was refused ?

A. Yes, I know there are complaints by a number who put in claims and thought they should have got scrip, but the commissioners did not find they had a good claim.

Q. It is claimed, on the other hand that similar cases have been dealt with more liberally by the commissioners, and perhaps with less rights than in the remaining cases ?

A. I never heard that. I have heard very little complaint about the commissioners.

Q. About the work of the Commission ?

A. I mean the work of the Commission.

Q. Now don't you think, Mr. Turriff, as a matter of opinion, of course this is not a political affair, don't you think perhaps it would have been wiser to have assigned the same date for the issue of this scrip in Manitoba and in the North-west Territories, why not give as long periods to the Manitoba half-breeds as are given to the half-breeds in the Territories or in certain parts of Manitoba. In Manitoba only those born prior to the 15th of July, 1870, have a right to a share of the scrip, whereas in the North-west Territories those born as late as 1885 have that right. Half-breeds born within half a mile of one another, just about the boundary, are in a different position from one another. Because one family happens to be on the territorial side of the boundary its members have an advantage of 15 years in regard to their chance of getting scrip. Don't you think it would have been better to have equalized that, and to bring the conclusion of the time on the same date, so that there would be no complaints at all, because I see no reason why there should be any difference between the Manitoba half-breeds and the half-breeds in the Territories. Of course, this is not the doings of the present Government, and therefore I cannot make political capital out of it, nor do I want to.

A. I understand that perfectly.

Q. There is a bitter feeling between these people inhabiting Manitoba and the North-west Territories. Even in Manitoba those living in that part of the province, formerly in the North-west Territories, have privileges that the rest of the province do not enjoy. It is a matter of opinion, of course, but your experience goes a long way.

A. I would not care to express an opinion on that, because I am not well enough posted on their reasons which led to the distinction being made. I deal with the scrip when it is issued in locating it simply as a land matter, but as to the merits or what led the Government to issue scrip I have a general idea, but I am not sufficiently posted to give an opinion.

Q. But you know that feeling exists ?

A. I know there are some who have applied for scrip and did not get it who think they should get it.

Q. You know there is a feeling that there is a sort of preference for the Territories as against Manitoba ?

A. I have heard it.
Q. You know it exists ?
A. I have heard it, yes.

LAND ENTRIES IN 1902 AND 1903.

Q. Well, if Mr. Turriff has anything else to tell us I know we would all be glad to hear him, or, if any of the members of the Committee would care to ask any questions, I have quite finished my questions.

A. I do not know that I have, except that I might say to the Committee that this year promises to be the biggest year we have ever had. Last year, during the calendar year 1902, we made 22,240 odd entries; this year I think we will run considerably over 25,000, possibly 30,000. For the first five months we have something between 14,000 and 15,000, about 14,500, and this month is going to be a big month. We are having a good deal of difficulty to face this year in the lack of surveys. We are bending every energy we possibly can to have all this land surveyed. A large amount of land is being surveyed along the North Saskatchewan river, both north and south, and all between the Saskatchewan and the Battle river.

By Mr. Ross (Ontario):

Q. Is that in the Edmonton district ?

A. From Edmonton down to Battleford will be surveyed this year and quite a lot north of the Saskatchewan, and all this country in here near Quill Lake, from the Quill Lakes north up towards Prince Albert, is being surveyed. We have every available surveyor we can get our hands on at work; anything of a good surveyor whom we can depend on. We have given contracts, too, in order to get a great deal more work than we could get done in any other way. I think we will get between 400 and 500 townships surveyed this year. There are 36 square miles in each township.

By Mr. Stewart :

Q. Was not all this land surveyed over 20 years ago?

A. Very little of it; some of it was. We have had one or two parties out doing what might be called re-posting. It is hardly re-surveying. The cedar posts are all burned out, and the mounds are so obliterated that in many cases, especially in scrub country, you cannot recognize them at all.

By Mr. Avery :

Q. What are you putting in, iron posts ?
A. Yes, iron posts.

By Mr. Ross (Ontario) :

Q. How do you mark these iron posts to indicate what they are ?

A. They put a tin tag on them, at least I think that is what is being continued now. They put an iron pipe down with a tin tag, the four corners of which are stamped and the post flattened on the top so that it cannot come off.

TIMBER BEARING LANDS.

Q. There is a good deal of land for settlement still in that north-wesern country ?
A. Yes.

APPENDIX No. 2

By Mr. Stephens :

Q. Is there any timber near Edmonton ?

A. There is not much timber from Edmonton down until you get to Prince Albert. North of Prince Albert you get a good deal of timber and a little near Fort Pitt, but not what you would call timber for merchant work.

By Mr. Avery :

Q. What kind north of Prince Albert ?.

A. All spruce, no pine here. When you get into the Rockies there is good spruce also.

Q. Is it large enough for saw-log purposes?

A. Oh, yes, they have some pretty good spruce in the north-west.

UNLIMITED COAL SEAMS IN WESTERN CANADA.

By Mr. Stephens :

Q. There is some coal land up there, I suppose, too ?

A. There is coal in fact wherever we have gone into the Rocky Mountains, north of the boundary line. I believe the largest deposit of coal known on earth is right here at the Crow's Nest Pass. You have coal on the east side of the Rockies in Alberta. I spent a week on the Crow's Nest coal deposit, and we had a cross section made of one mountain and there was one seam of 46 feet, a second seam of 46 feet, a third of 30 feet, and a fourth of 19 feet.

By Mr. Ross (Ontario):

Q. One on top of the other ?

A. Yes. Then there were seams of 4, 6, 8, 10, 12 and so on, a total of 202 feet of coal in vertical form, perhaps a hundred or two hundred feet apart.

By Mr. Kidd :

Q. What is the quality of that ?

A. It is bituminous, and some of it is the finest cooking coal in the world, equal to Welsh coal or Pittsburg coal.

Q. Is that from Coal creek?

A. Coal creek makes the best cooking coal, I understand. But the Morrissy, judging from the appearance, I would say, would be the finest mine. Then on the west side of the mountains, of course, there is a great deal of coal. The government has 50,000 acres of coal lands in British Columbia. On the east side of the mountain the same coal deposit practically exists. As the Rocky Mountains and the Livingston Range were pushed up through the cretaceous rock you find the coal there something like this, (illustrating a vertical semi-circle), the strata were curved so that in part the coal stood almost perpendicular.

By Mr. Ross (Ontario) :

Q. That is an unusal form of deposit, is it not ?

A. Yes.

Q. Is it a better shape of deposit ?

A. I do not think so.

By Mr. Avery :

Q. It is more uncertain ?

A. It is more likely to be crushed you know. There is a vast quantity of coal on the east side of the Rockies in Alberta. There is one place where there are three

seams, 40, 20 and 10 feet wide, making a total of 70 feet of coal standing almost on edge and within a hundred feet width.

By Mr. Ross (Ontario):

Q. If it stands on edge it is no wonder a mountain sometimes falls as it did at Frank.

A. My own impression has always been that the taking out of the coal at Frank, where it is nearly on edge, is possibly what caused that slide to start.

By Mr. Boyd:

Q. What about the coal at Edmonton?

A. I do not know much about it, except that it is a good domestic coal.

By Mr. Ross (Ontario):

Q. Is it a lignite?

A. I understand it is a bituminous coal, but I have always understood it is more of a domestic coal. However, I imagine that when they get in and make tests there will probably be as good coal as in the Crow's Nest.

By Mr. LaRivière:

Q. They use it very freely.

A. Yes, it is a fine domestic coal.

A MARVELLOUSLY RESOURCEFUL COUNTRY.

Mr. BOYD.—A friend of mine was telling me, who was there last summer, in speaking of the wealth of the place, that as he drove along he saw from his buggy one man getting out coal, another digging and washing gold in the North Saskatchewan, and a number of other men on their binders cutting wheat just outside of Edmonton.

A. Quite so.

Having read over the preceding transcript of my evidence, I find it correct.

J. G. TURRIFF,

Commissioner Dominion Lands.

APPENDIX

TO THE

PRECEDING REPORT

ON

AGRICULTURE AND COLONIZATION

RESOLUTIONS ADOPTED BY THE COMMITTEE.

The following resolutions were adopted by the Committee as recommendations for the promotion of the agricultural and immigration interests of the Dominion:—

No. 1.—THE ELECTION OF A CHAIRMAN.

Moved by Mr. Davis, seconded by Mr. Ross (Ontario)—That Mr. Douglas, the Member for Assiniboia East, be Chairman of the Committee for the current session of Parliament.—Motion adopted.

Mr. Douglas then assumed the duties of the Chair.

COMMITTEE ROOM 34,
March 24, 1903.

No. 2.—TO TAKE DOWN EVIDENCE.

Moved by Mr. Sproule, seconded by Mr. Wilson—That the Committee ask leave from the House to employ a shorthand writer to take down such evidence as they may may deem proper.—Motion adopted.

COMMITTEE ROOM 34,
March 24, 1903.

No. 3.—ON THE AGRICULTURAL RESOURCES OF THE YUKON

Moved by Mr. Robinson (Elgin), seconded by Mr. Wilson—That Professor John Macoun be called before the Committee at an early date, to furnish information on the soil of the Yukon.—Motion adopted.

COMMITTEE ROOM 34,
March 27, 1903.

No. 4.—THE SIR W. MACDONALD FUND.

Moved by Mr. Wright, seconded by Mr. Ross (Ontario)—That Professor Robertson be requested to appear before this Committee on a future date, to furnish an account of the work in progress under Sir William Macdonald's system looking to a consolidation of rural schools, for the purpose of promoting manual training and nature studies in the public schools throughout the Dominion of Canada.—Motion adopted.

COMMITTEE ROOM 34,
April 15, 1903.

No. 5.—TO PRINT EVIDENCE OF COMMISSIONER OF AGRICULTURE AND DAIRYING.

Moved by Mr. Ross (Ontario), seconded by Mr. Wilson—That 20,000 copies of the evidence of Professor J. W. Robertson, Commissioner of Agriculture and Dairying, before this Committee in the current session of Parliament, be printed in pamphlet form, forthwith, in the usual numerical proportions of English and French, as advance sheets of the Committee's final report, and to be distributed as follows:—Fifteen

thousand (15,000) copies to members of parliament ; four thousand nine hundred and fifty (4,950) copies to the Department of Agriculture; and fifty (50) copies to the use of the Committee.—Motion adopted.

COMMITTEE ROOM 34,
April 24, 1903.

No. 6.—THAT REPORT TO BE MADE TO THE HOUSE.

Moved by Mr. MacLennan, seconded by Mr. Hackett—That the report of the sub-committee, and adopted by this Committee on April 1, ult., in reference to the publication of a booklet upon fruit-raising in Canada, be reported to the House.—Motion adopted.

COMMITTEE ROOM 34,
May 1, 1903.

No. 7.—CONGRATULATIONS TO MR. J. W. ROBERTSON.

Moved by Mr. Stephens, seconded by Mr. Ross (Victoria)—That this Committee now tender their thanks to Professor J. W. Robertson, Commissioner of Agriculture and Dairying, for the valuable and progressive character of the evidence furnished by him before the Committee in the current session of parliament.

The Committee notice with much pleasure the reported recognition by two of the leading Canadian universities of Professor Robertson's energetic administration in the public service of Canada, and the signal benefits that have resulted to her agricultural interests therefrom, by conferring upon him the educational degree of Doctor of Laws, and we hereby tender to Doctor Robertson our cordial congratulations upon his well-merited honours.—The motion being put from the Chair was unanimously adopted.

COMMITTEE ROOM 34,
May 12, 1903.

No. 8.—TO PRINT EVIDENCE OF MR. W. A MACKINNON.

Moved by Mr. Ross (Ontario), seconded by Mr. Stephens—That 20,000 copies of the evidence of W. A. McKinnon, chief of the Fruit Division, Department of Agriculture, before the Committee in the current session of parliament, be printed in pamphlet form, and distributed as resolved by the Committee on April 24 ult., in reference to the printing and distribution of Professor Robertson's evidence.—Motion adopted

COMMITTEE ROOM 34,
May 15, 1903.

No. 9.—TO PRINT EVIDENCE UPON THE YUKON AND ON DRAINAGE OF LANDS.

Moved by Mr. Ross (Victoria), seconded by Mr. Stephenson—That 20,000 copies of the evidence of the respective witnesses who appeared before this Committee, in the current session of parliament, on the agricultural resources of the Yukon; and upon the effects of tile drainage on crop-producing soils, be printed forthwith, in pamphlet form, in the usual proportions of English and French, and distributed to members of parliament and others in precisely the same divisions as detailed in the Fourth Report of this Committee.—Motion adopted.

COMMITTEE ROOM 34,
May 2, 1903.

APPENDIX No. 2

No. 10.— TO SUMMON EVIDENCE ON IMMIGRATION.

Moved by Mr. Wilson, seconded by Mr. Richardson—That Mr. A. F. Holmes, of the town of Napanee, be summoned to appear before this Committee on Wednesday next, to give evidence with reference to immigration into the Dominion of Canada from the United States between the years 1886 and 1895.—Motion adopted.

COMMITTEE ROOM 34,
June 3, 1903.

No. 11.— TO PRINT EVIDENCE OF INSPECTOR OF BINDER TWINE.

Moved by Mr. Ross (Ontario), seconded by Mr. Stephenson—That 20,000 copies of the evidence of Mr. Haycock, taken by the Committee to-day, be printed in pamphlet form in the usual proportions of English and French for distribution to members of parliament.—Motion adopted.

COMMITTEE ROOM 34,
October 7, 1903.

No. 12.—TO INCREASE FIRST PROPOSED NUMBER TO BE PRINTED OF PAMPHLETS ON BINDER TWINE.

Moved by Mr. LaRivière, seconded by Mr. Wright—That the motion adopted by the Committee yesterday, in reference to printing in pamphlet form 20,000 copies of the evidence of Mr. Joseph Haycock on binder twine, for distribution, be now reconsidered, and that the number 20,000 be changed to 40,000 in report to the House.—Motion adopted.

COMMITTEE ROOM 34,
October 8, 1903.

No. 13.—COMPLIMENTARY VOTE TO THE CHAIRMAN.

It was moved that Dr. Douglas now vacate the Chair, and that Mr. Ross (Victoria) occupy the Chair *pro tem.* The Chair being assumed by Mr. Ross, it was moved by Mr. LaRivière, seconded by Mr. Bell—That the cordial thanks of this Committee be and are hereby tendered to Dr. Douglas for the patient courteousness, dignity and absolute fairness with which he has presided over and directed the business and investigations of the Committee in the current session, by which the harmony of the Committee was preserved and promoted throughout.

This motion was adopted with applause, and presented to Dr. Douglas by the hon. the Chairman *pro tem.*

COMMITTEE ROOM 34,
July 3, 1903.

The preceding resolutions are true copies as recorded in the minutes of meetings of the Select Standing Committee on Agriculture and Colonization on the respective dates specified.

J. H. MACLEOD,
Clerk to Committee.

INTERIM REPORTS.

FIRST REPORT.

The Select Standing Committee on Agriculture and Colonization present their First Report, as follows:—

The Committee recommend that the House grant them authority to employ a shorthand writer to take down such evidence as they may deem proper.

JAMES M. DOUGLAS,
Chairman.

HOUSE OF COMMONS,
March 24, 1903.

SECOND REPORT.

The Select Standing Committee on Agriculture and Colonization present their Second Report, as follows:—

The Committee recommend that twenty thousand (20,000) copies of the evidence of Professor J. W. Robertson, Commissioner of Agriculture and Dairying, before this Committee in the current session of parliament, be printed in pamphlet form, forthwith, in the usual numerical proportions of English and French, as advance sheets of the Committee's Final Report, and to be distributed as follows :—Fifteen thousand (15,000) copies to the members of parliament; four thousand nine hundred and fifty (4,950) copies to the Department of Agriculture; and fifty (50) copies to the use of the Committee.

JAMES M. DOUGLAS,
Chairman.

HOUSE OF COMMONS,
April 27, 1903.

THIRD REPORT.

The Select Standing Committee on Agriculture and Colonization present their Third Report, as follows:—

The Committee submit, for the information of the House, the following Report of a sub-committee, and said Report adopted by the Committee on April 1, 1903,

'The sub-committee of the Select Standing Committee on Agriculture and Colonization, appointed to examine into and report upon the advisability of procuring a second and extended edition of the pamphlet written by Miss Martha Craig, illustrating the fruit industry of a portion of western Ontario, beg leave to report as follows:—

'We are of opinion that a booklet prepared on the plan indicated by the sample above named is admirably calculated to attract the attention of people in the Old Land interested in fruit-growing.

'Miss Craig's proposal to us is to issue a second edition of the said work, eliminating from the sample shown to the sub-committee all that does not relate exclusively to fruit-culture and the results accruing therefrom, and to extend the scope of the work to all provinces of the Dominion.

APPENDIX No. 2

'Subject to these conditions, the sub-committee advise that your Committee recommend to the Honourable the Minister of the Interior and the Honourable the Minister of Agriculture, that Departmental support be granted to the extent of the acceptance of a sufficient number of copies of the said enlarged booklet as will warrant the authoress to proceed with the work to completion and publication at once.'

JAMES M. DOUGLAS,

Chairman.

HOUSE OF COMMONS,
May 5, 1903.

FOURTH REPORT.

The Select Standing Committee on Agriculture and Colonization present their Fourth Report, as follows:—

The Committee recommend that the following evidence taken before them in the current session of parliament be printed forthwith, in the usual numerical proportions of English and French, in pamphlet form, as advance sheets of the Committee's Final Report, for distribution to members of parliament and otherwise, as hereinafter specified, that is to say:—

1. Twenty thousand (20,000) copies of the evidence of Mr. F. W. Hodson, Commissioner of Live Stock,—fifteen thousand nine hundred and fifty (15,950) to the members of parliament; four thousand (4,000) copies to the Department of Agriculture; and fifty (50) copies to the use of the Committee.

2. Twenty thousand (20,000) copies of the evidence of Mr. W. A. MacKinnon, Chief of the Fruit Division, Department of Agricuture, in the usual numerical proportions of English and French; and to be distributed in precisely the manner and allotted numbers as detailed in the preceding paragraph (1) of this Report.

JAMES M. DOUGLAS,

Chairman.

HOUSE OF COMMONS,
May 15, 1903.

FIFTH REPORT.

The Select Standing Committee on Agriculture and Colonization present their Fifth Report, as follows:—

The Committee recommend that twenty thousand (20,000) copies of the evidence of each of the respective witnesses who appeared before this Committee, in the current session of parliament, on the agricultural resources of the Yukon; and upon the effects of tile drainage on crop-producing soils, be printed, forthwith, in pamphlet form, in the usual numerical proportions of English and French, as advance sheets of the Committee's Final Report, for distribution to members of parliament and otherwise, as hereinafter specified, that is to say:—

Nineteen thousand seven hundred (19,700) copies of such evidence to members of parliament; and three hundred (300) copies of each to the use of the Committee.

JAMES M. DOUGLAS,

Chairman.

HOUSE OF COMMONS,
May 29, 1903.

SIXTH REPORT.

The Select Standing Committee on Agriculture and Colonization present their Sixth Report, as follows:—

The Committee report herewith, for the information of the House, the evidence taken by them in the current session of parliament upon Immigration and Colonization, including all matters connected therewith which have come under the investigation of the Committee.

JAMES M. DOUGLAS,
Chairman.

HOUSE OF COMMONS,
June 26, 1903.

SEVENTH REPORT.

The Select Standing Committee on Agriculture and Colonization present their Seventh Report, as follows:—

The Committee recommend that 20,000 copies of the evidence of Dr. William Saunders, taken by this Committee in the current session of parliament, be printed in pamphlet form, forthwith, in the usual numerical proportions of English and French, as advance sheets of the Committee's Final Report, for distribution, as follows:—16,900 copies to members of parliament; 3,000 copies to be allotted to the Department of Agriculture for distribution ; and 100 copies for the use of the Committee.

That 20,000 copies of the evidence of each member of the official staff at the Central Experimental Farm who testified before this Committee in the current session of parliament, be printed forthwith, in pamphlet form, in the usual numerical proportions of English and French, as advance sheets of the Committee's Final Report, and distributed as follows:—19,600 to members of parliament; 300 copies of his own evidence allotted to each member of the said official staff; and 100 copies of each to the use of the Committee.

And that 1,000 copies of the evidence upon immigration and settlement, taken before the Committee and reported to the House, heretofore, be published in pamphlet form, in the usual numerical proportions of English and French, for distribution by the Bureau of Immigration.

The Committee recommend that the aforesaid evidence, together with the other evidence taken by them in the current Session of Parliament, form a portion of their Final Report.

JAMES M. DOUGLAS,
Chairman.

HOUSE OF COMMONS,
July 3, 1903.

PROGRESS IN DAIRYING.

HOUSE OF COMMONS,
COMMITTEE ROOM 62,
WEDNESDAY, April 1, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock, a.m., Mr. Douglas, Chairman, presiding.

Mr. J. W. Robertson, Commissioner of Agriculture and Dairying, appeared before the Committee and made the following statement:—

Mr. CHAIRMAN AND GENTLEMEN,—It was my misfortune last year to be called to England and thus prevented from meeting the Committee and offering the customary information regarding the work of the branch of the Department of Agriculture which is under my charge. The export commerce of this country in farm products is growing very fast. The export of food products only from the farms has grown from $24,680,572 in 1890, to $80,705,184 in 1902. I do not know of a similar record in the growth of the commerce of any country. That does not reveal the whole increase in the production of food products from Canadian farms. There has been in that period a reduction in the number of people producing foods in Canada and a very substantial increase in the number of people consuming food products. There is the development of mining and its allied industries; there is the extension of lumbering and the establishment on a large scale of the wood pulp and paper businesses; there is the marvellous growth of domestic and export commerce and also of manufacturing, with a consequent increase in the population of the towns and cities; and there is a remarkable development and increase of traffic in railway and steamship transportation. In a word, there are more people consuming and fewer producing, per thousand of the population, and good times generally with their more generous consumption. Notwithstanding that, the Canadian farmers have produced the bulk of the foods for the people of the whole Dominion, and whereas they spared only, in round figures, $24,000,000 for export in 1890, they were able to spare over $80,000,000 for export in 1902. Now that wonderful increase seems to me to be due to the advancement of education and organization among the farmers; and I am confident that the extension of these same two factors and means will bring about an equal advance in every department of Canadian national life. The farmers are making not merely sure progress, but swift progress. In three directions there has been this progress: in ability to manage the conditions that surround their business and to carry on its operations with skill; in intelligent understanding of the laws and forces of nature, which constitute and control some of these conditions; and in co-operation among themselves and with other interests and persons in the country, such as those of transportation and commerce. I am not going to speak at any length this morning on the meaning of these three qualities or capacities, viz., progress in ability, in intelligence and in co-operation, but they constitute education and I think there is no other education worthy the name. I know it is supposed to be in the Canadian constitution somewhere that questions and matters of education are reserved exclusively to the provinces and provincial legislatures, but I happen to be a living example of the action of at least one of the Dominion departments in promoting education, and to see the record of the results of that action in a large measure in the growth of the value of our food exports.

There is a heap of foolishness abroad, if I may use that word in a parliamentary committee, as to the meaning of 'education' and 'educated person.' If you take the uneducated—that is the baby, helpless, ignorant and selfish—you find the only marks of lack of education, in its helplessness, ignorance and selfishness. Advancement out of helplessness into ability, out of ignorance into intelligence, and out of selfishness into co-operation for the public good, means real progress in education. Not by going so many days to school or taking a course in college is education gained, but by doing the right things in the right way at the right time. The farmers are doing that, and therefore they are causing gratifying progress in the development of the country.

The main difficulties they meet with generally are four in number. There are the difficulties in the growing of crops. There are the difficulties in the maintenance of fertility. In France the people have managed to double the yield of their crops per acre in forty years, while we in Canada have managed to cut the yield of our crops in half, per acre, in many places in the same time. We began with virgin soil and they began with a worn-out soil. That is a striking contrast as to methods of farm management and the value of real education among the working farmers. Then there is the difficulty in keeping live stock profitably. I will use that chart which you see on the wall, shortly, to illustrate that. Then lastly there are the difficulties of preparing the products for markets.

THE SCOPE OF THE BRANCH OF THE COMMISSIONER.

In administering the branch of the Department of Agriculture under my more immediate charge, we put the work into seven divisions—the division of live stock, the dairy division, the cold storage division, extension of markets division, the seed division, the fruit division, and the poultry division. Each of these divisions has to do with some of these four difficulties—crops, fertility, live stock, or preparing products for market—and each one needs to have more than one capable man following the developments with care and skill. Some of the men need not merely to bring to their work accuracy, intensity and ability, but leisure time and a habit of meditation or reflection on what they have seen and learned, in order to see what might be done better. There is sometimes so much of a rush in the work of administration that a man in the public service does not have sufficient quiet time to think. In every nation's progress the leaders must be men who have leisure to think, and to plan, as well as merely to carry on the administration of the department.

This morning I now want to speak without much detail, on the progress in dairying education along some of its newer lines. Since the effort to improve dairying in Canada was first organized—it was first organized in a partial manner by voluntary associations of farmers and otherwise—but since it was first organized under the direct care of the provincial government in the province of Ontario in 1885, the exports of cheese and butter have grown very rapidly and are growing steadily. Not by an accidental advance, but by steady evolution and progress in dairy work all over the Dominion. In 1886 the value of cheese and butter exported from Canada was, in round figures, $7,500,000. Ten years later it was $15,000,000—double in ten years. That is since the beginning of organized effort on the part of the Ontario government. Then take the last ten years, during which the work was more generally organized in the whole Dominion, and from 1892 to 1902 the increase in the value of exports was from $12,700,000 to $25,300,000—again double, even on that large scale. There is another instance of growth equal to that; it is in the pork and bacon business, in which, before any systematic effort was made to put it on a rational, profitable basis, for and by the farmers, there was an export business of about $600,000 a year; that was in 1890. It had grown to $4,500,000 in six years (1896), and then in six years more (1902) it had grown to $12,500,000 of exports. I hope you take in the meaning of these few figures; exports of bacon and hams worth a little over half a million of dollars in 1890; $4,500,000 in 1896, and $12,500,000 in 1902. When you hear a good deal about the prosperity of Canada arising from the settlement of the North-west, do not be

misled in your judgment. The progress of this great Dominion has not been due to the prairies as yet, but to the farms and farmers of the other, the older settled parts of Canada. A large development may come on the prairies of the North-west later on, but just yet our progress and prosperity are seen chiefly on the ordinary farms on this the eastern side of the Great Lakes. Let me give you three instances, because I would like to have the Committee join me in believing that the possibilities of development in Canada are simply unlimited in this sort of work. We have not come to the end yet. Take one instance which is familiar to the Committee. I have given fuller details on many previous occasions, and not to waste the time of the Committee, I shall offer very short illustrations.

CO-OPERATIVE DAIRYING IN PRINCE EDWARD ISLAND.

There are certain places especially adapted for certain industries. The province of Prince Edward Island is especially adapted for butter and cheese factories, but that business was going backward for want of information and education. In the year 1892, with the assistance of money given by the Dominion government, I started one co-operative cheese factory at New Perth, in Prince Edward Island. The machinery was loaned by the government. We sent an instructor to organize the business and to arrange the locality into routes for the convenience of those supplying milk. We ran the factory as a government dairy station. In the autumn of 1892 I took the liberty of exporting to London $3,600 worth of cheese manufactured at that station, and I can recall the remonstrances of some of the people against risking their cheese in any steamer. I got fault finding letters asking me why I did not sell the cheese at home or in Halifax. I had been in England and knew something about the English market; and as I had insured the cheese for about 12 per cent more than it was worth, I felt easy on the subject. The cheese got to England, and was sold there for the top market price. Some of it indeed sold for sixpence per cwt. more. I angled for that sixpence and got it. Then, when the Island people knew that they had got sixpence per cwt. more for their cheese than was paid for any other Canadian cheese sold that day in London, it assured them that they could make fine cheese. That was the beginning of the export of cheese—to the value of $3,600.

At the taking of the census in 1891 there were four cheese factories in Prince Edward Island, with an output worth $8,448; when the census of 1901 was taken there were 47 cheese and butter factories, with an output valued at $566,824. There is the result of organization and education. There has been no increase in the number of acres of land, and there has been but little increase in the number of cows kept. The change has been in the intelligent labour applied to the conditions. The people now run their own factories, and have repaid to the government every dollar that was lent to them. I don't say that you could do this with dairying everywhere, but it can be done anywhere where the locality is adapted for it. There is no part of agriculture that is not susceptible to the same kind of improvement.

ONTARIO AND QUEBEC.

Take another instance on a larger scale. The province of Ontario is noted for the products of its cheese factories and creameries. It has made great advancement in quality and in quantity as between the two census periods 1891 and 1901. It increased the value of its output of butter and cheese from factories by over seven millions of dollars in ten years; that is to say, the value of the output in 1901 was $7,136,965 more than the value of the output in 1891. The province of Quebec had not advanced so far in co-operative dairying; but a beginning had been made in organizing its cheese factories and creameries into syndicates. The syndicate was a group of cheese factories employing the services of a travelling instructor.

In 1892 I had the pleasure and honour of helping to start a dairy school for the province of Quebec. I was a director of that school for some years, and the Depart-

ment of Agriculture at Ottawa authorized me, as Commissioner, to turn in $3,000 a year of Federal money to help the dairy school at St. Hyacinthe. Of course, I am not a constitutional lawyer. I was not supposed to know, and I confess I do not yet know, that the constitution of the Dominion reserves all questions and matters of industrial or technical education to the legislatures of the several provinces. I was not well informed with regard to that particular part of the constitution, and I confess I did not care very much. The constitution of a country, like the constitution of a man, may be for the weal of the country; and the weal of the country need never be subordinated for the sake of literal compliance with the phrases of its written constitution. 'The Sabbath was made for man and not man for the Sabbath.' So $3,000 a year of Federal money went to the province of Quebec to promote dairying and agriculture by means of education. We did not call it education. That might have been an unconscious slap at the constitution. We began by giving short courses in dairying. Some of the wiseacres said it was foolish to think of imparting any education worthy of the name in a two weeks' course. However, we made it a rule that only students should be admitted who had worked for one year in a cheese factory or butter factory. We had neither the time nor the money to devote to those floating atoms who, in an indefinite way, wanted a college education for dairying. So no one could get the course at St. Hyacinthe unless he had previously had one year of practical experience. These were the very people we wanted to help. These were they who needed help. Then, the provincial authorities went further in organizing the factories in syndicates. No one was allowed to become a syndicate instructor unless he had taken the course, or courses, of instruction at the St. Hyacinthe Dairy School. During the first year (1892-1893) 214 students took the course. The next year 268 students took the course. The third year 328 students took the course; and so on.

Let us come back now for a moment to the census period, and see what the census says about the progress of co-operative dairying in the province of Quebec during that period. I have said that the province of Ontario did very well in the census period in the development of its cheese and butter business. The value of the output of the cheese and butter factories in Ontario in 1901, was $7,136,965 more than it was ten years before. I am referring now to the growth and not to the total output. In Quebec the output was $9,343,371 more than it was ten years before. The Quebec people were said to be backward, but they made this advance because of the instruction given in dairying by means of education and organization. I could multiply such cases all over the Dominion, but I have said enough, I think, to show that there is good reason for expecting success in helping agriculture in all parts of Canada by improvements in the organization of education and in its quality as applicable to farm life and work.

By Mr. Ethier:

Q. What year was that St. Hyacinthe school opened?

A. In the year 1892.

By Mr. Cochrane:

Q. Have you the figures with you that you can inform me the first year that creameries were established in Ontario?

A. In the same year as Quebec—1862 or 1863—by Mr. Harvey Farrington in Ontario and Mr. James Burnet in Quebec.

By Mr. Ross (Ontario):

Q. Is that right about the creameries?

A. That was cheese factories—the date that cheese factories were organized.

Q. Mr. Cochrane asked about creameries.

A. I beg pardon, I am afraid I misunderstood. I cannot say from memory when the creameries were first established, but I think about 1880. The cheese factories and creameries of the province of Quebec are grouped into syndicates and they have travelling instructors employed by the Dairymen's Association of the province of Que-

bec, which pays half the salaries out of a grant received from the provincial government. There was systematic instruction and inspection, and every one of these instructors had to take a course at the St. Hyacinthe Dairy School.

ORGANIZATION OF COLD STORAGE SERVICE.

Another matter of importance was the organization of improved transportation under the name of cold storage. Let me give an illustration to show how this has been put into practical operation in Canada. Take the butter trade of Canada, which for export had shrunk to next to nothing, less than ten years ago. I need not remind those here of the kind of butter we got on hotel tables from twelve to fifteen years ago. Even the ordinary butter of commerce now is generally good. The export of butter from Montreal in 1894 was, in round figures, 32,000 packages. There was no organization in respect to the carriage of butter in cold storage. No one could get cold storage unless he had a carload to forward. No one could get cold storage on ship board, and few had it at the creameries. We started the organization of a cold storage scheme in 1895. We arranged with the railway companies to run refrigerator cars once a week for the development of this business. Last summer they were running refrigerator cars weekly from something over forty starting points to Montreal. The small shipper of a few packages could get his butter carried as safely as the shipper who had hundreds in his lot. Cold storage was arranged for at creameries. A small bonus was offered to all who would provide cold storage chambers and maintain them in accordance with regulations. Cold storage was provided on over thirty ocean steamships. The scheme became a national system of cold storage, whereby the product of the small shippers could be carried without deterioration from the starting points in Canada to the destinations in the United Kingdom. One result of the organization of service has been that the export of butter from Montreal, which was 32,055 packages during the season of navigation in 1894—before cold storage—had increased to 539,000 packages in 1902. The increase was sixteen fold in eight years.

By Mr. Sproule:

Q. Was all of that sent in cold storage?

A. Not quite; of the 539,000 packages, 525,735 packages went in cold storage.

GOVERNMENT CREAMERIES IN NORTH-WEST TERRITORIES.

In passing I would speak of one minor point of the dairy education work, and that is the establishment and maintenance of creameries in the North-west Territories by the department, as showing again the value of organization and education. Creameries were assisted in the North-west Territories by the Dominion government for three purposes: (1) for educational purposes, (2) to direct attention to the development of the country and (3) to help the new settlers for the time when they had most difficulties and the least chance of revenue. These three objects were clearly stated in the publications of the time; and I have no hesitation in saying that in many cases where we had creameries at first there will be no creameries after a number of years. The people there from climatic, soil and labour conditions will necessarily in farming devote their attention to producing grain and meats of different kinds. That is the destiny of large areas in the North-west Territories because of the conditions there. The climate, the want of suitable labour and other circumstances are not favourable to the development of dairying except in Alberta and in small parts of Assiniboia and Saskatchewan.

At that time (1896) the government arranged to make certain advances to creameries, and twenty dairy associations got something over $52,000 in advances, in several instances to help them out of really dire straits. People who started creameries themselves at an earlier date had let them fail; they had lost all their money; the accounts were in a most unfortunate state, and in every sense they were in bad condition. Since the department undertook to help them these people have repaid to the department

nearly $36,000 of the advances; eleven of the creamery associations have repaid all that they got, and others are paying up steadily, except two that are closed, at which, I think, the advances will not be repaid. I need not detain the Committee with a detailed account, but I would be glad to put in this typewritten statement of the amounts advanced and repaid and other facts the Committee might like to have in connection with this subject:—

STATEMENT showing total amounts advanced as loans and as payments for apparatus and fitting up of different creameries operated by the Department of Agriculture in the North-west Territories; also repayments of these advances.

Creamery.	Cash Loans.	Advances for Apparatus.	Total Amounts of Advances.	Repayments before 1902.	Repaid in 1902.	Amounts due to Department.
	$	$ cts.	$ cts.	$ cts.	$ cts.	$ cts.
Aetna		277 33	277 33	277 33		
Churchbridge & *Dongola.	600	4,618 61	5,218 61	5,218 61		
Edmonton & *Tributaries.	3,000	2,758 81	5,758 81	1,195 70	158 12	4,563 11
Grenfell		3,464 92	3,464 92	3,464 92		
Innisfail & *Tributaries.	4,500	2,594 44	7,094 44	5,383 33	1,076 32	1,711 11
Maple Creek		1,619 86	1,619 86	548 02		1,071 84
Moosejaw	750	1,661 74	2,411 74	2,411 74		
Moosomin		2,558 61	2,558 61	1,435 40	130 66	1,123 21
Olds		1,262 14	1,262 14	1,131 22	70 80	130 92
Prince Albert and *Duck Lake	1,000	2,206 19	3,206 19	735 00	147 27	2,471 19
Qu'Appelle		2,171 31	2,171 31	1,306 98	104 63	864 33
Red Deer		1,464 91	1,464 91	1,464 91		
Regina & *Craven		1,729 18	1,729 18	1,610 49		118 69
Saltcoats		651 64	651 64	651 64		
Saskatoon		206 48	206 48	206 48		
Tindastoll & *Swan Lake		1,421 74	1,421 74	1,421 74	215 80	
Wetaskiwin & *Tributaries		3,786 93	3,786 93	1,852 88	455 36	1,934 05
Whitewood		2,732 43	2,732 43	2,732 43		
Wolseley & *Moffat		2,962 21	2,962 21	912 73	163 33	2,049 48
Yorkton		2,474 82	2,474 82	2,474 82		
	9,850	42,624 30	52,474 30	36,436 27	2,522 29	16,037 93

* Skimming Station.

By Mr. Sproule:

Q. Before taking up another subject I would like to ask for a little information upon one matter with which you have already dealt. You said that 539,000 packages of butter were sent out of Canada, of which 525,000 packages were sent in cold storage. Therefore there seemed to have been 13,000 boxes sent otherwise. Have you any information as to the amounts realized from that sent in cold storage as compared with that not sent in cold storage?

A. Practically nobody ever sends fine butter to Great Britain not in cold storage; but there is still some butter sent as ordinary freight, low grade butter for which shippers are not willing to pay the extra freight charge for cold storage. Creamery butter going outside of cold storage in summer would not come within two cents a pound of the selling price of the same butter sent in cold storage. Some butter goes to Newfoundland and the West Indies not in cold storage.

By Mr. Cochrane:

Q. What would you understand by cold storage, ventilated compartments?

A. No, an insulated chamber, cooled by mechanical refrigeration.

In reference to the creamery output in the North-west Territories, the Committee may be interested to learn that even up there with the heavy freight charges, when

butter was shipped from these creameries to the United Kingdom under well organized management the farmers have got good prices. The average price last summer for all the creameries in the North-west Territories under the charge of the department, after taking off all freight charges, was 19·6 cents a pound of butter at the creameries. The average price for winter butter (we ran four creameries in the winter), has been between 23 and 24 cents a pound, so these people are getting fair prices and are now, as you may infer, very well served.

THE COOL CURING OF CHEESE.

Now I come to deal with what the department has been doing towards the further improvement of the large cheese trade and giving it as safe an outlook as departmental assistance could help it to have. In England there has been a change in the taste of the people in regard to nearly all their foods. They now want nearly every sort of animal product of much milder flavour than years ago. They want their cheese especially mild, soft, and as they call it, fat. It is quite impracticable to have a cheese retaining a mild flavour in a fat body if it is kept above 60° of temperature during the ripening period; and our climate in Canada in summer goes a long way above that. Therefore there is need for controlling the climate in the particular place where the cheese is kept, to enable us to meet English demands in reference to the qualities they want. As long ago as 1892, the department began investigations into the best methods of curing cheese.

In 1899 we took practically the whole of the product of two cheese factories and cured them at different temperatures, one in Quebec and one in Ontario. We did that also in 1900. Our investigations made this quite clear, that cheese cured at a temperature continuously under 60° was worth more in the market, had better flavour, better body, and lost less weight by shrinkage, than cheese cured at the usual temperatures. These were important points to have demonstrated on a large scale. Still there is a difference, as the members of this Committee will very well know, between discovering and announcing a truth on a scientific basis and getting that applied to the business of the country so as to make it profitable. The scientific men, I use that word in its widest common-sense meaning, the men with the largest range of organized knowledge, classified knowledge, the scientific men are usually away in advance of the men who are engaged in industrial, manufacturing or directly productive occupations. Just as that distance is shortened, just so much as that distance is reduced, does the work of the investigators help the men who are actively engaged in the business of production and manufacturing. How could we shorten that distance, in the cheese industry? We tried by publishing documents. That helped in some measure. We addressed conventions; we did everything we could to bring about a knowledge of this improved method of curing cheese and to show its benefits. But something inherent in humanity seems to keep the average man from applying a principle into practice efficiently until he has seen it actually so applied successfully. There is ever recurring need for the object lesson, the example, the practical illustration. If you look over history you will find that the philosophy—the testimony, the service to truth—that takes concrete form in some fine ideas, lived out in their fulness to their corresponding ideals by some person, is the one that attracts followers.

Let me make an explanatory parenthesis here. There is a real difference between knowledge and ability. There is a wide difference between soil physics and practical tillage. Every man who understands soil physics can manage land and crops better than if he did not understand the principles. Knowledge will help every man to greater ability, but it does not in itself constitute or confer business ability. A man may know all about the composition of a soil and still be a poor farmer. Therefore, some one may say, 'Throw knowledge to the winds.' Not so. Every man does better insofar as he knows more and knows better; but a man may know much and not be able to apply it. There is a difference between scientific knowledge and the business

application of it. Huxley once said he could not grow as big turnips as Hodge, but he could tell Hodge what would enable him to grow still bigger turnips and to make more money.

As an instance of how intelligent cultivation may affect the temperature in the soil, let me mention the result of certain experiments by King on eight farms in Wisconsin. When land was rolled after being seeded the temperature between 1 and 4 o'clock in the afternoon was about 3 degrees higher at points between 1½ to 3 inches in depth than on similar land left unrolled. The explanation of that is in the fact that the rough surface radiates heat, while the smooth surface gives the best chance for absorbing the heat of the direct sunshine.

A difference of 3 degrees in the temperature of the ground may make all the difference between a good start and a slow start in the growth of the crop. If you could have that simple fact known all over Canada it would be of great benefit. If the boys attending the rural schools would demonstrate the fact by experiments of their own, using a thermometer, do you think any of them would forget the results ? That, in itself, would be a valuable part of education for the boy. It would mean a better understanding of natural forces; it would awaken other curiosities, and so the boy would be led out into further knowledge and ability. That is only a bare instance for illustration and not for definition.

Everyone knows now that to get this increase of temperature land should be rolled after the seed is sown, and then a light harrow run over it afterwards to kill the weeds and keep the moisture in the soil. Now weeders are going into Manitoba in carloads, to harrow the land after sowing and rolling; and so to save the moisture for the growing crop. There is value in a knowledge of soil physics as applied to practical work.

By Mr. Wright:

Q. Does that apply to any soil?

A. To any soil in sunny weather in the spring.

Q. To give a smooth surface?

A. A rough surface allows the heat to radiate; a smooth surface absorbs and retains more of the heat from the sun.

By Mr. Cochrane:

Q. Was there any more moisture in the land that was rolled than the unrolled land?

A. The thermometers were put alongside on the same farm, and these showed the difference in temperature only.

Q. The thermometers showed a difference?

A. I think the land would dry out a little faster on the surface of the unrolled land. After the light harrowing which follows the operation of rolling, that surface would dry out still faster; and then the thin layer of dry soil would prevent evaporation and the drying out of the deeper soil.

By Mr. Wright:

Q. Do you use a light harrow?

A. A light harrow with teeth sloping backwards; or better still, a weeder with teeth or fingers which pull out the weeds but not the grain.

Q. I use almost any kind of harrow on my farm.

A. Yes, so long as it does the work properly.

By the Chairman:

Q. The application of that principle in the North-west, especially about Indian Head, has practically solved a serious problem in that district; where wheat raising

was a failure we now have a success, due entirely to the adoption of this principle of rolling and harrowing after.

ILLUSTRATION COOL CURING ROOMS.

Since cool curing is desirable for cheese and gives the result in quality which the market wants, the question we have to ask ourselves is what means should be adopted to get it in the cheapest and best way. The sub-earth air duct has been recommended; it lets the air into the curing room through a duct underground and allows it to be cooled by passing through tiles in the earth. I had ducts like that in operation twenty years ago, in 1883. But few of the 3,000 odd cheese factories in Canada used any agent or appliance for the cooling of the curing rooms.

The use of a cement floor sunken in the ground is another method of using the cooling power of the earth; the whole floor becomes a cooling agent. As far back as 1885 I used stone walls and cement floors for curing rooms, and these gave a large extent of cooling surface; but the appearance of mould on the cheese prevented their usefulness. It is only of late years that the means have been discovered to prevent mould by the use of formalin and of paraffin wax to keep the surface or rind of the cheese clean. With these we can follow the practice of having stone walls and cement floors sunken in the ground as cooling agents, and so can use this large surface of stone and cement without much expense. The use of these must become general in this Dominion; and I shall speak a little later of the value of cement floors for cow stables. The want of cement floors to keep the stables warm in winter has prevented the success and extension of winter dairying. When we have cement floors generally we shall have a large expansion of winter dairying in Canada.

By the authority of the Minister of Agriculture it was decided to establish four experimental and illustration cool-curing rooms in Canada. In Ontario one was established at Brockville, which has the largest cheese board of any in Canada I think; another at Woodstock, a large railway and market centre for cheese in western Ontario. In Quebec we have them at Cowansville, the largest cheese board and market of Quebec, and at St. Hyacinthe, in the heart of the French-speaking country, where dairying is followed. These four centres were chosen and buildings were put up, properly insulated and constructed so as to be object lessons. The capacity of each was 2,700 boxes of cheese on the shelves. We took in cheese from surrounding factories from the first of July to the end of September, altogether 26,531 boxes of cheese, from 37 cheese factories. The salesmen controlled the cheese themselves and sold them as they liked. We did not own the cheese as a department and had no control over them or their manufacture. We had simply charge of the curing of them, and charged the factories only the value of the difference between the shrinkage of weight of cool-cured cheese and cheese cured in the ordinary way. That was the only revenue we had, and it was for the last year $3,139.04. The saving in shrinkage of weight was 31,403 pounds on the 26,531 boxes of cheese which we handled. Mr. Ruddick, chief of the dairy division, gives, in a report, details of the shrinkage, the methods of management and the practical part of the work generally. As I think the members of this Committee would be glad to see that incorporated as part of my evidence, I will, with your permission, put it in as an appendix to to-day's evidence.

By Mr. Cochrane:

Q. Could that be applied to ordinary factories?

A. Yes; I will speak in a moment about its being applied in ordinary factories. In our work we put aside from every factory once a week, or oftener, two cheese from the same batch ('batch' is the term used to designate all the cheese from one vat of milk), so that the cheese were exactly alike in quality before the curing process began. In every instance one of these cheese was put in the cool-curing room and the other, its mate, in the ordinary curing room. We had altogether 450 pairs of cheese like

that. We had them examined by cheese makers, by merchants from Montreal and elsewhere, by myself and by experts; and in no single case was the cheese cured in the warm ordinary curing rooms as good in quality, as good in flavour or body, as its mate which was cured in the cool-curing rooms. Of these 450 pairs examined last year, in nearly every case these cool-cured cheese were decidedly better than their mates cured in the ordinary way. These cheese were made by ordinary cheese makers in ordinary factories, and in every instance the results in quality were substantially better from the cool-curing rooms than by the ordinary method. Mr. Ruddick's paper gives the details of the difference in temperatures.

Q. What is the difference in the time of curing?

A. About a week longer in the cool room to bring the cheese to what is called the breakdown stage; not more than that, at a temperature between 54° and 58°, as against a temperature ranging from 60° to 80° in the ordinary curing rooms. Out of these four cool-curing rooms there were sold 500 lots of cheese by the salesmen, week by week. Last season was a particularly favourable year for cheese-making, but I heard of only four lots that were complained of by the buyers as being at all inferior; and the inferior quality was not due to the curing of the cheese, but arose from other causes. These cheese were sent to England through the usual channels of commerce, and the English salesmen said that the cool-cured cheese were substantially better and sold for higher prices than lots cured under the ordinary conditions. We followed up some of the different lots to the other side, to the English markets. We had only one little slip that I want to explain. We were late in the season in being ready to start the cool-curing rooms, and some of the cheese got a little mouldy before we could correct it; and some of our patrons thought that was going to do a lot of harm. At St. Hyacinthe, where we had more moulded than usual, owing to the lumber being perhaps a little green and the floor not quite dry, the cheese buyers who bought the cheese one week docked the price of the cheese on delivery half a cent a pound. The cheese buyer of course will take every chance he gets to dock the price of the cheese; that is his business. I do not say it is dishonest; the buyer evidently counts it a legitimate part of his business in buying cheese to dock the price if he can. But in the case of those St. Hyacinthe cheese which were slightly moulded it was unfair docking; the buyers took an unfair advantage of the salesman. The reason I say that is because I had a man go to the warehouses in Montreal the next day and try to get these cheese back at the full price for which they were first purchased, and the buyers would not give them up. We got hold of one lot that was docked; it afterwards brought the full price of finest cheese. It was made in July; and the cheese were sold in Glasgow in December, for a price equal to September cheese—63 shillings per cwt.; and they were bought at first from the salesman at St. Hyacinthe at 9½ cents. I cannot make it too plain, that this little trick of getting after the cheese makers and upon unwarranted pretexts docking the price of cheese has done the trade much harm. As far as we could manage it we stopped it last year. The statement I have made shows the result in one instance.

By Mr. Cochrane:

Q. Where was your government inspector? Have you not a government inspector?

A. We had an official referee at Montreal, but this salesman at St. Hyacinthe accepted the buyer's statement of conditions before he knew all the circumstances. I can only give the Committee one or two words more on this subject. We have been striving also to have the cheese sent from Canada boxed in better boxes, so as to be delivered in England with fewer breakages. Part of the expenses at the illustration cool-curing rooms was due to the fact that we paid more for cheese boxes than the ordinary prices. Our patrons objected to paying more than the usual figure for the ordinary cheese boxes, so the difference was charged to our department. We paid $501 more for boxes last year, which represents the difference between what the extra

strong boxes cost us and what the factories paid us. That is also an object lesson and it has had the effect of bringing about a general desire for better boxes, in order that our cheese may be landed in England in better condition.

By Mr. McEwen:

Q. What do these cheese boxes cost?

A. They cost us 15 cents each in some cases; and this year we are going to use a still stronger box, to see if it produces still better results, because the additional cost of the box is a mere bagatelle in comparison with probably two shillings more per cwt. on the other side for the cheese. We found in some cases that as many as 40 per cent of the cheese boxes ex some cargoes at Bristol were broken when taken out of the ship, in large cargoes of over 7,000 boxes each.

The average cost of running these four illustration curing rooms, including those things I have told you, was $1,862 each; that was for maintenance for the year; and that includes all the educational work we are doing this winter by the four superintendents travelling around attending the farmers' meetings.

By Mr. Cochrane:

Q. That was the cost of maintenance, but not of the building?

A. Yes, that was the cost of maintenance. In Canada we make practically three-fourths of the cheese in June, July and August, that is during the hot weather months. If we get all these cheese cured at a low temperature, we can put on the market in July, August and September, not a whole lot of hot flavoured and ill conditioned cheese, which act like a drag on the market, but good quality of mild cheese. We can give the English consumer a cheese which he wants and a cheese for which, if we keep up the quality, there will be a demand that will keep pace with any possible production during the next ten years. We can always find a safe market if we give to the consumer the article he wants; and, as I have shown you, the cost of obtaining this excellence from cool-curing is not very great.

By Mr. Kendall:

Q. A few years ago it was said that we had, comparatively speaking, reached the limit of our cheese sales in Great Britain. What do you say about that?

A. I have heard that statement made for the last fifteen years, that we were near the limit of our profitable production, so far as the market was concerned; and yet last year we sent out $20,000,000 worth of cheese and the market prices were seldom if ever better than they were then. It is a question of quality; the English consumer will eat almost any quantity of a dainty thing if he can get it, in good condition; and if we can keep our cheese up in quality on the average to that of our cool-cured cheese, we can, I believe, double our exports in the next twenty years and still have a profitable market price.

By Mr. Ross (Ontario):

Q. How do you arrive at the total production?

A. We take these figures of exports from the returns of the Trade and Commerce Department, which published the returns of exports, and we add a little for home consumption. The figures I have quoted from the provinces of Quebec and Ontario were taken from the census. The cool-curing of cheese may become common at individual cheese factories; quite common. There are many places in Canada where the consolidation of curing rooms is not practicable. There are perhaps forty centres, taking Canada as a whole, where the consolidated curing room will be the most effective and cheapest way. We will have two methods—one the improvement of the curing rooms at the individual factories; and the other the centralized curing rooms, each serving a number of factories. Both methods—the improvement of the individual curing

rooms and the establishment of consolidated cool-curing rooms, or modifications and combinations of both—will bring benefits to all concerned; the patrons by getting more for their milk; the cheese makers by having less risk of loss and trouble with their product; the cheese buyers by having a safer article to handle; and the consumers by getting a more wholesome and better article of food. There is a practice that has come out of this also; that is the practice which is now practicable, of coating the cheese with paraffin wax in order to prevent mould and shrinkage in weight. We tested the practice on cheese cured at the ordinary atmospheric temperature and found that it cannot be done with advantage on cheese cured above 65° or 70°, because the cheese take on an unsightly appearance; but where cured at a low temperature, the use of paraffin wax as a thin coating all around saved a large amount of shrinkage in weight. Cheese paraffined in August and September had not lost any weight when shipped in February, as against a loss of 2½ pounds per box in cheese under ordinary conditions, not paraffined.

By Mr. Ross (Ontario):

Q. What is the cost of paraffining?

A. Perhaps two cents per cheese of about 70 pounds; it does not require more than two ounces of paraffin.

By Mr. Cochrane:

Q. Could you give me an idea of the cost of hauling the cheese from the factories, within a radius from Brockville cool-curing room?

A. The whole cost of hauling cheese from the factories to the cool-curing room at Brockville last year was $702. We hired teams to bring the cheese in regularly and the cost was $702. As a matter of fact, cheese has to be taken to a railway station some time; and if there is to be delivery by the patrons themselves, the cheese may as well be delivered when it is two days old as when it is two weeks old.

By Mr. Kidd:

Q. Are these curing stations to be open this summer?

A. We established them with the intention of keeping them open under departmental control three years.

By Mr. Cochrane:

Q. In connection with the cool-curing room, is it necessary to have the walls of the basement of stone?

A. It is an advantage to have the floor anywhere from 2½ to 3½ feet under ground, to get the full value of the cooling power of the earth at that depth. You need stone walls a little above the ground and above that an insulated wooden wall. Wooden shavings are more satisfactory than sawdust as insulating material.

Q. The shavings are the best you say?

A. Yes.

By Mr. Wright:

Q. You said something about cement cellars in stables; is that embodied there or shall we lose it?

A. I shall refer to it again.

By Mr. Sproule:

Q. You say that covering with paraffin prevents shrinkage and waste? Would you mean that that is due to its imperviousness?

A. That is the main reason for using it in the curing of the cheese. We went so far in experimenting on this line, that we had some new cheese put in tin cases and

sealed up hermetically. They were kept sealed for months and it was found that these cheese were as well cured as those which were not encased. There was no difference in the curing when the cheese was covered as imperviously as tin or paraffin would make the covering.

By Mr. Kidd:

Q. Does it cure as well as in the box on the shelves?

A. Unless one is quite careful to have a dry, well-seasoned box we find the odour of the elm wood penetrates the cheese.

IMPROVED TRANSPORTATION FACILITIES.

Let me now speak of what the department is doing to help in the safe transportation of cheese and butter. There are many difficulties in getting perishable products from our country to the British market, because of distance, because of deterioration from high temperatures and because sometimes of rather high charges. These are the three difficulties, distance, deterioration from unfavourable temperatures, and high charges. Now three things seem desirable in transportation, safety, which comes foremost, regularity and reasonable rates. I think in Canada we have obtained a transportation service which includes all these three as applied to cheese and butter, safety, regularity and reasonable rates. It costs very little more to take cheese from any town in Ontario or Quebec on a main line of railway, to London, England, than to take it from my own native county of Ayr, in Scotland, hardly any more.

By Mr. Ross (Ontario):

Q. Ayr, in Scotland?

A. Yes. The rates on Canadian railways and on steamships are reasonably fair.

Q. How far is it from Ayr to London?

A. About 400 miles.

Q. And 3,000 from Toronto?

A. Yes, about 3,500.

Q. And you say the freight is practically the same?

A. About the same.

By Mr. Cochrane:

Q. How do the rates charged from American points across the Atlantic compare with the rates on the Canadian lines?

A. Ours from Canadian ports are usually a little higher on cheese than from Boston or New York.

By Mr. Kendall:

Q. Is it not complained by the farmers in Scotland and England that the railway rates are almost prohibitive?

A. Quite too high. We have striven to get cold storage at creameries by publishing plans and offering a bonus, which is still available, to the extent of $100 per creamery, under three conditions, (1) that the cold storage shall be properly constructed (2) that the factory shall turn out a certain amount of butter, and (3) that the cold storage shall be maintained at a suitable temperature. The bonus is not paid unless these conditions are complied with: (1) construction, (2) quantity of butter, and (3) maintenance of cold storage. A good many butter makers were dissatisfied last year because they did not get the second or third payment of the bonus. That was because they made cheese, but if they make butter this year and comply with the conditions, they will get the bonus.

By Mr. Ross (Ontario):

Q. Do you know the rates from Ontario points to London on cheese?

A. I am not sure of the present rates. It has been anywhere from 40 shillings up to 55 shillings a ton.

Q. A ton?

A. A ton, yes. That would be about 2 shillings a hundred weight, 50 cents a hundred weight.

By Mr. Kidd:

Q. That is the winter rate?

A. The winter rate, yes. I have known the rate to be as low as a quarter of a cent a pound. I have shipped for that right to London.

Q. 26 shillings is the rate very often. That was the rate a year ago, last summer.

A. That was when the rates were low. That would be about a quarter of a cent a pound.

Q. Yes, a shade over a quarter of a cent.

A. On the railways, provision has been made for running cold storage cars in a large way, from 42 points once a week to Montreal and from six points once a fortnight. We guarantee that the railway companies will earn by each car per trip two-thirds of a carload rate from the starting point. Many of the cars pay their way, but on some of the routes they do not, because the trade is not developed yet; that is why the yearly payments by the government have not become less, because when one route becomes self-sustaining, new routes are started.

We have had three inspectors doing missionary work in that connection; the main business of one of them is to visit the railway agents and educate them on the meaning, uses and application of cold storage. It was quite a common thing for a cold storage car to come to a station and be left with the doors open for half an hour. Then too a farmer will sometimes bring in butter and leave it on the station platform, in the sun. That is from ignorance of course ; but the butter is damaged and goes into the car heated and damages some one else's butter. We have been trying to remedy that by giving information and counsel.

We have an inspector at Montreal who examines the cars to see how they come in, and to see that the railways do their duty. He examined last year 629 carloads of butter. He could not examine all that came in, but he examined that many, and reported on their condition. Then in special cases he put a thermometer into the butter to find whether it was cold when it started on its journey or not, and if it was not, he got after the creamery man who tried to make the car a cold storage room to cool his butter, instead of using it to keep it cold. Sometimes he found the butter colder near the surface than at 2 or 3 inches deep, which showed that the car had cooled it from the time it was shipped. We are following up this to get the butter shipped in a proper state.

By Mr. Sproule:

Q. Are the great bulk of the cars kept under proper cold storage?

A. Not more than perhaps ten cars out of the 629 were last year reported as being without ice or in bad condition on their arrival at Montreal. An intimation to the men in charge has usually brought about any necessary change.

By Mr. Robinson (Elgin):

Q. Is the butter packed in square boxes?

A. In boxes of 56 pounds each.

Then we also took up with the railway people the matter of getting better cars and better car service for cheese. Sometimes a refrigerator car is used for carrying cheese. Now, a refrigerator car *without ice* does not give nearly as good service as a common box car. The closed refrigerator car without ice catches the heat of the sun and gets warm inside. We got the railway companies to build some specially insulated

and ventilated cars to carry cheese and apples safely. I am told that the Grand Trunk is building 100 of these for its own use this year, the ten built last year at the request of the department doing so well. Now I think we are well served with cold and cool storage on the railway lines.

This brings me to the subject of cold storage on the ocean steamers. Last year there were 250 sailings of steamers from Montreal with food products, and of these 127 sailings had cold storage. That is quite a notable growth, since not a single steamer carrying food products from Montreal in 1894 had any cold storage at all. We placed on these steamers 148 thermographs. This is a little instrument which registers the temperature continuously. We have the charts from them come back showing us what the record of temperature for the whole voyage was. That chart, of which I have several here, lies around a drum driven by clock work. It takes 14 days to turn round once, and as it moves, a little pen point traces a line which shows the temperature continuously day by day. Here is one taken from the *Hurona*, which left Montreal on August 21 last, and that is the record of temperature where butter was stowed. In that case it was from 29 to 31 degrees Fahr. We do no trust to the engineer's report; this is an automatic register. We are getting a number more of these thermographs and putting them in different parts of the ships.

By Mr. Ross (Ontario):

Q. Can any one tamper with those?

A. They are closed and locked at Montreal by one of our inspectors.

Q. And opened at the other end?

A. Opened on the other side by our inspectors. The charts are endorsed by our inspectors with their name, as you will see, and come back to us. They cannot be tampered with. We found the cold storage was bad in a few instances and sent the charts to the steamship agents for their information. They replied that it should not happen again. It removes the element of doubt, often a cause of trouble between shippers and the steamship company when they have to rely only on a record of temperatures taken by a ship's officer.

By Mr. Stephens:

Q. Was there much difference between the proper temperature and what it should be in those cases you mention?

A. One chart gave a reading of 51 degrees Fahr.

By Mr. Sproule:

Q. You say there were 250 sailings last year, out of which 120 had cold storage.

A. There were 127 sailings with cold storage from Montreal. We have three inspectors at the port of Montreal to watch the loading of food stuffs, to see they are stowed in a proper way, and to report on breakages. They reported on 250 sailings of steamers with food stuffs last year.

By Mr. Cochrane:

Q. What do we understand by that cold storage system?

A. It is all mechanical refrigeration put in by different firms who manufacture and install refrigerating machinery. There is also cool storage on ten steamers, provided by mechanical refrigeration and the circulation of cooled air through the compartments where cheese or apples are stowed ; that is apart from these 127 sailings with cold storage. We are now trying to get the steamship people to keep the cold storage for butter at 25 degrees and under, and the cool storage for cheese and apples under 60 degrees continuously ; the one—the cold storage—for butter, and the other—the cooled air in circulation—for cheese and apples. Nearly every summer there have been complaints from the fruit trade on the lack of cool—cooled air—storage on steamers.

By Mr. Sproule:

Q. What is the experience of sending fruit last year?

A. The department did not send any. Apples, except the very early tender varieties, do not require more than ordinary cool storage, but pears do need cold storage. Shippers sent a good many pears last year with success, all in cold storage.

By Mr. Robinson (Elgin):

Q. Was there any report made of some shipments spoiling?

A. There were four or five.

Q. Why was it?

A. In one case the inspector reported that they were over-ripe at Montreal, so that in that case it was the shipper who was to blame. I think, perhaps, Mr. Chairman, the Committee would like to have Mr. Mackinnon, chief of the fruit division, here to be examined specially on that matter. He spent ten months in Great Britain last year, and is thoroughly familiar with this whole fruit question.

By Mr. Kendall:

Q. Do you advise 25 degrees for meat?

A. Chilled meat should be kept at 29 degrees.

Q. Cold storage for butter is 25 degrees ?

A. Yes, and as much lower as practicable.

Q. And for meat?

A. There is a good deal of frozen meat shipped in cold storage; as a rule frozen pork, which should be kept under 20 degrees.

THE PREVENTION OF MOULD.

I wanted to say a word about one other matter, that is, the trouble that has come to the country from the appearance of mould on butter. That is not due to any fault in the butter itself; but occurs first on the paper with which the boxes are lined. The butter paper or the butter boxes become covered with spores of mould. Mould is a plant, small in size, that comes from spores, which serve the same function as seed. I will give you an instance of its prevention. Mould was common on the butter shipped from the North-west creameries in 1897. Then we adopted the practice of soaking the paper in which it was packed in a brine made of salt and formalin. Since then we have had no mould on the butter from that district. We have been publishing the details of that to every creamery. Yet this is from one of the leading butter makers: He said to me last year, 'I have followed your prescription for preparing the paper and still the butter was condemned as being mouldy.' I asked him, 'What did you do?' He answered, 'We took the butter papers and soaked them in brine and after they were soaked we hung them up in the creamery to dry. When they were dry we put them in the butter boxes, and still the butter was mouldy.' There it is you see—sterilizing the paper first by soaking it in the formalin water, and then undoing everything by hanging it up to dry, letting it be exposed to infection of spores after sterilization. That is where the services of the travelling instructors are always valuable. They can give information upon all these points and prevent these mistakes being made. If that practice of soaking the butter paper in brine, with one ounce of formalin in every gallon, was general, the appearance of mould would entirely cease.

By Mr. Kendall:

Q. Did you ever try boracic acid, and is it effective?

A. It does not prevent mould. We always put two thicknesses of paper in the butter boxes.

Q. Does the odour of the formalin affect the butter?

A. The odour of the formalin does not injure the butter at all ; it is merely used for killing the mould on the paper and boxes, and is not put in or on the butter.

APPENDIX No. 2

By Mr. Cochrane:

Q. Is this preparation readily applied?

A. Yes, it is readily applied and not at all costly.

VALUE OF CO-OPERATIVE TESTING ASSOCIATIONS.

If I may take another ten minutes, I would like to take another side of this dairy business. I have been speaking mainly on the particular part of dairying that is associated with the manufacturing of the product and with the transportation of the article. I have said nothing about the production of milk. That in itself is a theme, an important theme, and, of course, a large one. I would like to lay emphasis on two points for the benefit of this Committee. There has been hardly any attention in Canada paid by the general farmer to the systematic breeding of dairy cows. There has been a lot of talk about thoroughbreds, and people have been bolstering up names, by lists of prizes at shows and such like, and others have been led by the use of these names into doing things that do not pay. Let me give you an instance of a more excellent way. Over in Denmark—where they have had, I think, the best common school system in the world, a common school education which has done a great deal for the benefit of the farmers—they have formed small co-operative testing associations among the farmers for a definite purpose. These small co-operative testing associations have been striving to do four things. First of all let me tell you what one of these small co-operative associations is like. Often they are limited in membership to twelve men in the locality. Three directors are appointed by the association, and of these, one retires every year, so that each holds office for three years. They undertake to do four things for themselves, and by themselves, with some government help in the form of a grant of a little money to help to pay expenses. They first of all undertake to find out how much is the cost for feed per cow in their own herds, by once in a while getting, by weight or measure and calculation, a rough business estimate of the cost of food per cow or per herd. Then they have the milk of each cow weighed once a week; this is not done every day, because to do so would involve too much labour. Then the milk is tested as to quality often enough in the season to show what percentage of fat is applicable for the whole year, say once a fortnight or once a month. That is quite close enough for practical purposes. Then they make a statement showing the relation of the cost of the feed consumed to the value of the product. We do not do that in Canada, except perhaps in one herd in a thousand, and it is a mistake that we do not. Nobody can run any business successfully unless he keeps books or unless he knows the relation of the cost of production to the price received for the product. Let me give you one instance of what they have done in Denmark by one of these testing associations. They have now over 250 of these testing associations in that kingdom. Here is the result of a typical one for the last three years: The increased yield of milk per cow in their herds from 1899 to 1902, was an average of 942 pounds of milk per cow, per annum, being an increase of 18 per cent in that period. The yield was increased from 5,162 pounds of milk per cow in 1899-1900, to 6,104 pounds of milk per cow in 1901-1902. There was an increase in butter of 47 pounds per cow, or 24 per cent in the three years. These are marvellous results to be attained in three years, especially when we find that meanwhile there was a reduction in the cost of food, by the farmers learning the effects, the best value to be found from the feed and the best way of balancing the rations. If you can get both an increase in the quantity of milk per cow and an improvement in the quality, as they have in the case I have cited, and at the same time effect a reduction in the cost of production, you are on the right lines for a tremendous increase in the profits of the business. That is what they are doing in Denmark.

By Mr. Sproule:

Q. Is it a fact that suitable food will increase butter fat and also increase the quantity of milk, at the same time reducing the cost of the feed?

A. The result of their observations has been to show that it has increased the yield of milk per cow, and wherever they have increased the yield of milk, they have also increased the percentage of butter fat. I know it has been the common impression that the contrary was the case, but the records show that the percentage of fat in the milk has been increased as well as the quantity of milk per cow.

By Mr. McEwen:

Q. How do you account for that?

A. I attribute the reduction in the cost of food to better management; and the increase in the yield of milk to that also; including intelligent selection and breeding of the herds.

By Mr. Cochrane:

Q. Did the reduction in cost of food decrease the percentage of fat?

A. It did not decrease the percentage of fat. There was an actual increase in the percentage on the average of all these cows.

By Mr. Cochrane:

Q. Is it in the food that the increased production of butter fat was caused, or in the cow?

Q. As a matter of fact, whatever increases the milk production seems to increase the percentage of fat.

Q. In the same quantity?

A. It increases the percentage of fat as well as the quantity of milk, but as a matter of fact the giving of milk of a very rich or a very poor quality in the percentage of fat is largely a matter of constitution with a cow, and may arise from some other fact or set of facts than because it is of a certain breed.

A COW CENSUS IN WISCONSIN AND ITS LESSONS.

I desire to present some facts brought to light in a most striking way by an investigation conducted by Mr. C. P. Goodrich, of Wisconsin. I am indebted to *Hoard's Dairyman* for the information contained in a paper read by Mr. Goodrich before the convention of the Wisconsin Dairymen's Association at Fond du Lac, on February 11, of this year. As the time now at my disposal this morning is short, I shall submit to you the points which impressed me most in Mr. Goodrich's most excellent paper, substantially in his own words :—

'At the request of the President and Secretary of the Wisconsin Dairymen's Association, I came to Fond du Lac county last November to gather statistics from creamery and cheese factory patrons in relation to the dairy business, as it had been carried on here for the twelve months preceding October 1, 1902, with a view to presenting the results of my investigations to this meeting. I was well aware that here, as elsewhere, some men were carrying on the business at a good profit, and others at a loss, or, at best, getting very small pay for the work connected with it. I hope to be able to present the facts and figures, which I have gathered, in such a way—contrasting the methods of the most successful with those who have been less successful—as to enable those who have been working for nearly nothing, feeding and caring for cows, to do better in the future, by following the methods of those who have been making good profit.

'THE SCOPE OF THE INQUIRY.

'I visited 48 creamery patrons and 12 cheese factory patrons. I ascertained the average number of cows each had kept during the year, including the whole number, as well when they were dry as when giving milk, because they were eating all the time

in either case, and counting heifers, after having their first calves, as full cows; the kind of cows and the kinds and amounts of the different feeds given the cows, and estimated the value of the same.

'HOW COST OF FEED WAS OBTAINED.

'I charged the cows for the feed raised on the farm the market price for which it could have been sold at the time, and for that which was purchased, the market price at at the time it was fed. The prices I fixed on feeds are as follows: Timothy hay $12 a ton; other kinds of hay $8; corn stover $3, and ensilage $2.50. Pasture I fixed at the uniform price of $5 a head for the season. Oats were $28 a ton; corn, $21; bran averaged $19.50; gluten feed, $24; malt sprouts, $18.50; and oil meal, $30.

'I assumed that each cow consumed of roughage during the winter two tons of hay, or its equivalent. In the case of corn stover I figured that, as a rule, only about half its weight was eaten, as the thick, hard stalks and some of the rest was refused by the cows or trodden under foot and wasted. Therefore, when all the roughage a cow had during the winter was corn stover I calculated it took four tons, or $12 worth. If half of her roughage was corn stover I charged her six dollars for it.

'I had some difficulty in finding out the amount of grain feed each man fed. Some men, it is true, could tell me the exact amount of feed they had bought or had ground; then it was easy. Some could only tell by measure; then my experience in measuring and weighing feeds would enable me to estimate the amount in pounds. Some, who fed shock corn, could only tell the number of acres fed. In such cases I had to make an estimate from that.

'I do not claim that I have got the cost of feed of cows in every herd exactly right. From the nature of the case that would be impossible, but I believe that I have approximated pretty closely to it.

'QUANTITY AND VALUE OF PRODUCT.

'After getting all these facts from the patrons, I obtained from the creamery and the cheese factory the amount of milk delivered by each patron, the amount of product and the amount of money received for each of these 12 months. From these data I was able to figure out the average per cow, of milk, of product and of money per cow, together with the prices obtained and the profit or lack of profit per cow in each patron's herd.

'WHY PRICES FOR BUTTER DIFFER.

'It will be observed that some patrons received a higher price per pound for butter than some other patrons did. This is owing to the fact that those who received the higher prices produced a larger portion of their milk during the winter months when the price of butter was the highest. The price of milk also varied, not only for this reason, but also on account of the difference in the percentage of fat it contained.

'These facts and figures I have arranged in as convenient a form as I could devise, in the following table. The names of these patrons are not given. They are represented by numbers. I made a promise to that effect, when seeking the information, to each patron and also to the proprietors of the factories.

Cost of Feed and Income in 48 Herds Belonging to Patrons of Creameries in Fond du Lac County, for the 12 Months Ending September 30, 1902.

Patron's Number.	No. of Cows.	Kinds of Cows.	Cost of feed per cow.	Returns for butter from creamery per cow.	Net profit or loss from butter per cow over cost of feed.
			$ cts.	$ cts.	$ cts.
1	14	Grade Jerseys and grade Guernseys	42 00	57 89	15 89
2	21	Guernseys, ¼ bloods	31 00	29 26	-1 74
3	13	Grades, Durhams and Holsteins	25 00	33 17	8 17
4	25	Grade Guernseys and grade Jerseys	28 00	57 18	29 18
5	8	High grade Short-horns	28 00	37 81	9 81
6	11	Grade Jerseys	30 00	31 54	1 54
7	12	Grade Guernseys and grade Jerseys	30 00	44 05	14 05
8	10	Grade Guernseys and grade Jerseys	34 00	35 03	1 03
9	8	Grade Short-horns	34 00	33 06	-0 94
10	20	Grade Jerseys	38 00	41 40	3 40
11	9	Grade Jerseys	24 00	36 64	12 64
12	7	Grade Durhams	29 00	27 95	-1 05
13	11	Grade Jerseys, 2 grade Durhams	22 00	29 78	7 78
14	18	Grade Holsteins and grade Jerseys	30 00	22 67	-7 33
15	12	Grade Holsteins and grade Jerseys	27 00	28 61	1 61
16	15	Grade Short-horns	24 50	34 46	9 96
17	18	Holsteins and grade Jerseys	30 50	43 19	12 69
18	17	Grade Guernseys	31 00	36 80	5 80
19	10	Grade Holsteins and Durhams	22 00	32 95	10 95
20	5	Grade Jerseys	27 00	48 79	21 79
21	22	Holsteins and Holstein grades	25 00	45 17	20 17
22	10	Grades of different dairy breeds	38 00	42 23	4 23
23	28	Grade Durhams, some grade Holsteins and Jerseys	28 00	31 16	3 16
24	25	Grade Jerseys and grade Short-horns	32 00	34 31	2 31
25	16	Holsteins	40 00	67 79	27 79
26	17	Short-horns and some Jerseys and Holstein grades	34 50	24 33	-10 17
27	14	Grade Holsteins	31 50	31 28	-0 22
28	7	1 grade Holstein, 2 grade Jerseys, balance common cows	40 00	45 39	5 39
29	10	Grade Holsteins	33 00	37 11	4 11
30	8	Common cows	30 00	33 06	3 06
31	18	Common stock	24 00	34 22	10 22
32	10	Common cows with a little Jersey blood	23 00	24 98	1 98
33	15	Common cows	25 00	33 41	8 41
34	7	2 grade Jerseys, balance grade Durhams	28 00	40 23	12 23
35	10	Grade Jerseys and grade Short-horns	36 50	44 91	8 41
36	10	Grade Short-horns	30 00	28 57	1 43
37	10	Grade Durhams	31 00	26 49	-4 51
38	11	Jerseys and grade Jerseys	27 00	39 18	12 18
39	12	Common cows	30 00	27 34	-2 66
40	15	Mostly grade Short-horns	27 00	41 06	14 06
41	9	2 gr. Guernseys, 2 gr. Holsteins, rest grade Short-horns	32 00	35 34	3 34
42	20	Grade Guernseys, grade Jerseys and grade Holsteins	30 00	31 25	1 25
43	10	Grade Jerseys and grade Short-horns	20 00	28 66	8 66
44	13	Grade Short-horns	35 00	35 40	0 40
45	14	Grade Red Polls and grade Short-horn, 2 grade Jerseys	32 00	32 80	0 80
46	13	Grade Durhams and common stock	26 00	30 53	4 53
47	12	Grade Durhams	31 00	28 46	-2 54
48	7	Common cows	28 00	37 27	9 27

AVERAGES FROM THE CREAMERIES.

The 48 creamery patrons had 637 cows. By averaging the whole, we find the average cost of feed per cow to have been $29.88; average returns for butter from creamery, per cow, $35.82 ; average pounds of milk, per cow,4,204 ; average pounds of butter, 185; average net price of butter per pound to patron, 19·27 cents; average price

of milk per 100 pounds, 85·2 cents; average value of butter for one dollar's worth of feed, $1.20; average net profit from butter per cow, over cost of feed, $4.94. Now, if we add 20 cents a hundred to the value of the milk as the value of the skim milk (and with the high price of all kinds of feed, last year, it was surely worth that) that would make $8.20 more, making an average profit per cow of $14.34. This is not so bad, after all, and shows there was a fairly good profit for the Fond du Lac dairyman even last year, when the high price of feed had cut down the yield and the profits below what they had been in previous years.

'And still I have not counted all that the patrons received from their cows. There were the calves; the whole milk used in the family; the whole milk fed to the calves; and the manure to keep up the fertility of the farm. These last items varied considerably on the different farms, but as it would have been impossible to arrive at anything like a just estimate of their value, I have left them out entirely. It is true that some patrons used more whole milk in their families, and fed more to calves than others, still it is not likely there would be more than two dollars' difference per cow in extreme cases. Yet these last mentioned items, when all put together, would help to a considerable extent, to pay for the labour in caring for the cows.

'I have selected a few numbers, some of the best and some of the poorest, and will now go into the particulars of what I learned concerning them, and see if we can discover the cause of the great difference.

'ONE MAKES A PROFIT AND ANOTHER A LOSS.

'No. 1—Had 14 cows, grade Guernseys and grade Jerseys, fresh in spring and winter; cost of feed was $42 per cow for the year; returns from creamery for butter per cow, $57.89; pounds of milk per cow, 5,488; pounds of butter per cow, 300; average price of butter per pound, 19 cents; average price of milk per 100 pounds, $1.05; value of butter for one dollar's worth feed $1.38; value of butter per cow over cost of feed, $15.89. Average ration: bran, ground oats and corn, 13 pounds to fresh milkers, shredded corn stover, and for two months in spring timothy hay; run to straw stack; in summer pasture only. Adding 20 cents per 100 pounds, for skim milk, would make profits per cow $26.87.

'No. 2—21 cows, quarter-blood Guernseys, fresh all the times; cost of feed, $31; returns from creamery, $29.26; pounds of milk, 3,361; pounds of butter, 155; price of butter, 18·9 cents; price of milk, 87 cents; for one dollar in feed, 97 cents; value of butter per cow, less than cost of feed, $1.74. Ration: bran and middlings 4 tons, which would make less than two pounds per day during winter; 4 acres, heavy crop, well eared sweet corn, and timothy hay; in summer, pasture only. If value of skim milk is added, his profits would be $4.98 per cow.

'Now, can we see what made the difference in results between these two men? It is no doubt partly owing to the difference in the kind of cows—quarter-blood Guernseys may have been the product of a half-blood sire, or a cross of something with half-blood Guernsey dams—but mainly to the feed.

'No. 1 fed a fairly well balanced ration. He fed high; believed in feeding well, let it cost what it would, so he told me. His feed was very expensive, yet he made a good profit.

'No. 2 fed a very carbonaceous ration, did not believe in buying feed, but in feeding what he could raise on the farm, whether it made a well balanced ration or not.

'THE BANNER HERD.

'No. 4—25 cows, grade Guernseys and grade Jerseys, fresh at all times; cost of feed, $28.00; returns from creamery, $57.18; pounds of milk, 5,809; pounds of butter, 298; price of butter, 19·2 cents; price of milk, 98·4 cents; for one dollar in feed, $2.04;

net profit of butter over cost of feed, $29.18 per cow. Ration: bran and malt sprouts, 6 pounds; well eared ensilage, 30 pounds; straw; fodder corn in fall; in summer pasture only. Adding value of skim milk makes profit $40.80 per cow.

'SAME KIND OF COWS BUT LESS PROFIT.

'No. 7—12 cows, grade Guernseys and grade Jerseys, most of them fresh in October and November; cost of feed, $30.00; returns from creamery, $44.05; pounds of milk, 4,201; pounds of butter, 220.3; price of butter, 20 cents; price of milk, $1.05 per 100 pounds; for one dollar in feed, $1.47; net profit of butter over cost of feed, $14.05. Adding value of skim milk makes profit $22.81. Ration: bran and some corn and oats, 4 pounds; ensilage, 35 pounds, a little oat hay; corn stover cut, wet, mixed and heated with ensilage; in summer pasture only, except a little in mangers to induce them to come in to be milked.

'A BEEFY TYPE HERD.

'No. 12—7 cows, grade Durhams of beefy type, fresh in winter and spring; cost of keeping, $29.00; returns from creamery, $27.95; pounds of milk, 3,266; pounds of butter, 152·2; price of butter, 18·4 cents; price of milk, 85·6 cents; for one dollar in feed, 96 cents; value of butter per cow less than cost of feed, $1.05. Adding value of skim milk makes a profit of $5.48 per cow. Ration: malt sprouts and ground oats, 6 pounds; corn stover, marsh hay and straw.

'It is plain to see why No. 12 did not get as good returns as No's 4 and 7. He fed fairly well, though not as well as 4 and 7 did, for they fed ensilage; but apparently the main reason is, he was giving his feed to cows of a beefy type, while theirs were cows of good dairy type.

'THREE GOOD HERDS, WELL MANAGED.

'No. 20—5 cows, grade Jerseys, good dairy type, 3 fresh in March, 2 fresh in September. Cost of feed, $27.00; returns from creamery, $48.79; pounds of milk, 4,375; pounds of butter, 245; price of butter, 19·9 cents; price of milk, $1.11; for one dollar in feed, $1.80; net profit of butter over cost of feed, $21.79. Adding value of skim milk makes profit $30.54 per cow. Ration: 2 tons bran to the five cows; shredded corn stover and timothy hay, (¼ of roughage, hay); in summer pasture only.

'No. 21—22 cows, Holstein and Holstein grades, 4 or 5 fresh in fall, balance in winter and spring; cost of keeping, $25; returns from creamery, $45.17; pounds of milk, 6,016; pounds of butter, 231·6; price of butter, 19·4 cents; price of milk, 75·1 cents; for one dollar in feed, $1.81; net profit of butter over cost of feed, $20.17. Adding value of skim milk makes profit $32.20. Ration: 1½ pounds bran, 45 pounds ensilage, 8 pounds clover hay, and oat straw, all they will eat.

'No. 25—16 cows, Holstein thoroughbreds and very fine dairy type, most of them fresh in fall; cost of keeping, $40; returns from creamery, $67.79; pounds of milk, 8,396; pounds of butter, 333; price of butter, 20·3 cents; price of milk, 80·7 cents; for one dollar in feed, $1.69; net profit of butter over cost of feed, $27.79; adding value of skim milk makes profit $44.58. Ration: 8 pounds bran, 40 pounds of well eared ensilage, hay and corn stover, all they would eat; in summer good pasture only. Cows kept in good barn and fastened in Drown stalls.

'COLD BARNS NOT CONDUCIVE TO PROFIT.

'No. 26—17 cows, Short-horns and Short-horn grades, a few with a little Jersey and Holstein blood, fresh one-half in fall, rest in spring. Stable cold, cows fastened with chains; cost of keeping, $34.50; returns from creamery, $24.33; pounds of milk, 3,182; pounds of butter, 133; price of butter, 18·3 cents; price of milk, 76·5 cents;

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for one dollar in feed, 70 cents; value of butter per cow less than cost of feed, $10.17; counting the skim milk at 20 cents a 100 pounds there is still a deficiency of $3.81. Ration: bran, oats and corn ground, 8 pounds, marsh hay, a little timothy hay and fodder corn, not well eared. In summer, pasture and a little bran.

'What is the matter with No. 26? In the first place, his cows are not very good dairy cows; and secondly, and the main cause of his failure to get better returns, is his barn was so cold and his cows so uncomfortable that although half of them were fresh in the fall, they produced very little milk during the winter, as shown by the records of the creamery. He fed very well and quite expensively, but the cows had to use most of the feed to keep warm, and left but little for milk production. They gave most of their milk in summer on pasture, but even then they did not do very well, owing no doubt to the care they had in winter.

'ENSILAGE A FACTOR IN PROFITABLE DAIRYING.

'There are five creamery patrons who fed ensilage: No. 4, who made on butter $29.18 profit per cow; No. 7, who made on butter $14.05 profit per cow; No. 17, who made on butter $12.69 profit per cow; No. 21, with $20.17 profit per cow; and No. 25, with $27.79 profit per cow. One cheese factory patron fed ensilage, No. 4, whose profit on milk delivered was $22.23. These six silo men averaged $21.02 profit per cow, while the average profit of creamery patrons was only $5.94 per cow. The gross returns for the silo men averaged $52.52 per cow, while those who did not feed ensilage received an average of but $34.00 per cow, a difference of $18.52 in favour of the ensilage men.

'Can any one doubt, in face of these facts, that it will pay to build a silo? Is it possible that all this gain in gross receipts and profits is because these men feed ensilage? Or, is it, in part, because these men are more progressive, up-to-date farmers, have better dairy cows, study to feed a balanced ration, and, in short, have less of old fogyism than many of those who do not have silos? These are questions for you to ponder on and answer.

'My own opinion is that, although I think any man is making a great mistake who keeps a herd of dairy cows without having a silo, the feeding of ensilage did not and could not, of itself, make this astonishing difference of over 54 per cent in gross receipts and more than 500 per cent in net profit.

'Prof. Voorhees, Director of the New Jersey Experiment Station, found that ensilage increased the amount of milk 12 per cent over dry feed of the same kind, when everything else was equal. Taking that statement as being the real difference in favour of ensilage, then in our case $4.08 out of the $18.52 gain per cow should be credited to ensilage and $14.44 to "the man behind the cow."

'So I hope that none of you here who have had small returns per cow will entertain the idea that all you have to do, to get as large returns as these men who fed ensilage, is to build a silo. A silo will no doubt help some, but something else is needed.'

LESSONS FOR CANADIAN DAIRYMEN.

These statements as presented by Mr. Goodrich furnish much food for thought by Canadian dairymen. It would be most useful to have a similar cow census taken in a number of different localities in the Dominion. I would draw particular attention to the fact that every dairyman who made a large profit per cow, fed corn ensilage, with one exception. The expensive nature of a cold stable for cows during the winter is made clear. If every dairyman who attempts winter dairying in Canada provided a cement floor in his cow stable, the gain to him in every direction would be great. In very cold weather the cement floor becomes a means of warming the stable by conducting the heat of the earth into the interior. In the cool-curing rooms, with their cement floors, the temperature during the winter has not gone below 40 degrees when

they have been empty and entirely without fires, although the temperature outside has been 20 degrees below zero at times. We have kept a record for the whole winter and the information thus obtained is very suggestive indeed.

By Mr. Cochrane:

Q. What kind of a silo is best?

A. On the whole I think the round silo, and for durability one lined with cement. That is one important thing for us. We can have profitable winter dairying in Canada if we have warm cow stables and ensilage. We will find such dairying profitable.

By Mr. Thompson (North Grey):

Q. Another question. You did not give us any definite figures or final amount as to the quantity of milk used by the family, or in feeding calves, or the quantity of butter used.

A. This was in a dairying section, and the man who took the census, Mr. Goodrich, indicated that there was practically not enough difference per cow to affect the conclusions he drew.

Q. There is, however, in the tables a deficiency on that point, and you could not accept these figures as being accurate?

A. Except as illustrations of important principles, and methods of management.

Q. There might be quite a difference?

A. Yes.

By Mr. Stephens:

Q. Some of these men might have had large droves of pigs?

The Committee adjourned.

Having examined the preceding transcript of my evidence of April 1, I find it correct.

JAS. W. ROBERTSON,
Commissioner of Agriculture and Dairying.

(Addendum to preceding Evidence of April 1, 1903)'

By Mr. J. A. RUDDICK, Chief of the Dairy Division.

THE COOL CURING OF CHEESE

It has been known in a general way for many years that when Canadian Cheddar cheese is exposed to the extreme heat of summer during the period of curing or ripening, there is more or less deterioration in quality, and some unnecessary loss of weight, but it required the experimental results of the last four or five years to show how serious is the injury to the texture and flavour of cheese, and how much is really lost in weight, when the temperature in the curing room is allowed to go too high. We now know that certain undesirable characteristics and defects in the quality of summer cheese, which were considered at one time to be inseparable from the hot season, can be almost, if not wholly, avoided, if means are adopted to secure a proper temperature. The investigations along this line have taught us also that the maximum temperature at which cheese may be cured without injury to the quality is very much lower than was commonly supposed, and further, that the minimum temperature at which proper curing will take place is a great deal lower than any one imagined possible for securing good results. Babcock and Russell have cured cheese at temperatures ranging down to below the freezing point of water, and their work, along with that of Van Slyke, Dean, and others, proves beyond any doubt that cheese may be cured at temperatures as low as 40 degrees Fahr., or even lower, with most excellent results, as far as the quality of the cheese and the saving of shrinkage is concerned. The employment of such a low temperature is generally referred to as 'cold curing,' and if I may be allowed to draw a line of division, I would say that all cheese cured at temperatures under 50 degrees might be called 'cold cured,' to distinguish them from those cured at temperatures ranging from 50 to 60 degrees, which are more properly described as 'cool cured' cheese. At first sight this may appear like making a distinction without a difference, but on the whole, I think there is sufficient reason for making the two classes. The cold curing of cheese introduces entirely new and altogether artificial conditions, because under no circumstances has a natural temperature lower than 50 degrees been employed for the curing of Cheddar cheese. 'Cold curing' entails heavy expenses for refrigeration, and as it takes from 5 to 8 months to properly cure the cheese at 40 degrees, the length of time that the producer would have to wait for his money is something that has to be considered. On the other hand, the cool curing of cheese is simply an attempt to create conditions at all seasons, similar to those existing naturally when the very best results are obtained. It has always been considered that the finest quality of Canadian cheese is produced during the months of September and October, when the average temperature ranges from 55 to 63 degrees throughout the cheese-making sections of Canada. The Cheddar cheese-maker's ideal is, however, the best of the English and Scotch makes, and it is on these cheese that the taste for Cheddar cheese has been cultivated. It is worthy of note that the average temperature of the English and Scotch curing rooms is not over 60 degrees. The cool curing of cheese, therefore, does not introduce any new conditions, nor does it involve any expense that will not be fully met by the saving in shrinkage, to say nothing of the improvement in quality. Furthermore, it requires only about a week longer at a temperature of 55 to 60 degrees to produce the physical change which we call 'breaking down' as compared with the length of time required

in ordinary uncontrolled temperatures, which may range as high as 80 to 85 degrees. It would appear that the checking of the ripening process is proportionately much more appreciable after the temperature is brought below about 55 degrees, than it is down to that point.

It is along the line of cool curing that the department has been working for some time. During the seasons of 1899 and 1900 an extensive series of experiments were conducted at the Carp Cheese Factory, under Prof. Robertson's direction, and the information thus collected has been freely circulated among those interested in such matters. On several occasions samples of cheese from the same batches, but cured at different temperatures, have been submitted to the Montreal buyers and other experts, and in every case they have pronounced the cool-cured cheese to be superior in quality to the ones cured at ordinary temperatures. The difference in value has been placed as high as 1 cent per pound. The question of improvement in curing rooms, and kindred topics, have been discussed at meetings and through the press, for two or three years past, and the advantages to be derived from such improvements have been clearly set forth, yet there has not been as much progress made in this direction as there ought to have been, and it seemed as if something more was necessary to convince those engaged in the manufacture of cheese that it is a matter of economy to spend sufficient money on the improvement of curing rooms to ensure proper control of temperature at all seasons of the year.

CENTRAL COOL-CURING ROOMS.

With the object of providing a practical working illustration, on a scale sufficiently large to attract general attention, to thoroughly test the commercial aspect of the question, and to get a comparatively large number of people directly interested in the results, Parliament was asked last session to vote a sum of money to be used in constructing four large central or consolidated cool cheese curing rooms.

It is generally known that this plan was carried out, and that curing rooms were built at Woodstock and Brockville in Ontario, and at Cowansville and St. Hyacinthe in Quebec, where sites with siding accommodation were given by the Grand Trunk and Canadian Pacific Railway companies. I shall endeavour to briefly describe these curing rooms, and to give some notes and observations on the results of their operation during a part of the season of 1902.

In describing the buildings I may say first that the temperature is controlled with refrigerating machinery at Woodstock and Cowansville, while ice is employed at Brockville and St. Hyacinthe. The buildings are all designed on one general plan, but where ice is used there is a separate chamber in which it is stored. The curing room proper consists of a basement 9 feet clear between floor and ceiling, and a little over half below the ground level. The stone walls, which do not rise above the surface of the ground, are laid with cement mortar to make them waterproof. The floors are constructed of the best quality of Portland cement concrete. The walls above the stone work consist of 7-ply of lumber and 8-ply of paper, 4-ply of which are of damp-proof quality. The last two courses of lumber on the inside, with damp-proof paper between, are continued down to the floor inside the stone wall. There are two one-inch air spaces in addition to the space between the studs. The ceilings underneath the joists are made of 4-ply of lumber, 4-ply of paper and one air space. Above the joists there is a double flooring with 2-ply of paper between. The spaces between the studding and joists are filled with planing mill shavings.

The ice-chamber is placed at one end of the building, but does not go below the ground level, which brings the floor of this chamber about 4½ feet above the level of the curing room. The insulation of the ice-chamber is rather better than that of the curing room, and differs in two respects : (1) The walls are constructed with 'staggered' studding, that is to say, there are two rows of studs, one for the inside sheathing and the other for the outside, leaving a space of one foot between the two sheathings, with

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no connecting pieces. The ceiling is made in the same manner, and the spaces between the inside and outside sheathing are all filled with planing mill shavings. (2) The concrete floor of the ice chamber is covered with 3 inches of dry sand. Above this there is a false floor resting on 2 x 4-inch joists. The lower edges of the main joists are about 6 inches above the top of the false floor. The main floor consists of 2-inch tongued and grooved lumber, covered with galvanized iron, which is flashed along the walls to a height of 10 inches. The space between the floors is filled with planing mill shavings.

The upper story of the building is not insulated, except a compartment used for boxing and shipping. The rest of this flat is utilized for office, receiving room, storage of boxes, experimental rooms, &c. The floor of the shipping room is on a level with the floor of a railway car standing on the track alongside.

The plan for utilizing the cooling power of the ice is simple and effective. Placed just above the floor level of the ice chamber and, therefore, about 4½ feet above the floor of the curing room are three openings, 18 x 9 inches, through which the cold air flows into the curing room. The warm air returns to the ice chamber through three flues, 18 x 9 inches, running the length of the curing room just under the ceiling, and rising to the top of the ice chamber. There are several openings in these flues, which, being fitted with slides, enable those in charge to regulate the temperature so well that it does not vary two degrees from day to day in any part of the room. The ice is not covered, so that the air passing over it is readily chilled and purified and dried to some extent. The insulation of the chamber is depended on to prevent excessive waste of ice.

The mechanical refrigeration at Woodstock and Cowansville is effected with 6-ton vertical, double cylinder, single-acting ammonia compressors of the Linde British type, using the forced air circulation system for cooling.

The size of the curing room proper is 60 x 42 feet, and the five tiers of shelves hold exactly 2,700 cheese, and leave room for storing several hundred more in boxes, but having the cheese of so many factories to keep separate, it is not practicable to fill the shelves all full. The temperature of the curing rooms was maintained constantly between 54 and 58 degrees as long as they contained any cheese. There was not the slightest difficulty in regulating it so that it did not vary more than one degree from day to day. The records of temperature, both in the cool rooms and in the warm or uncontrolled rooms, were kept by means of thermographs, instruments which give a continuous record on paper, so that we know exactly what the temperature was at any time of the day or night.

I need not go further into details of construction, as a bulletin with complete plans and specification, such as will enable anyone to make use of the ideas incorporated in these buildings, is now available for distribution.

Having said so much by way of description, it will now be in order to refer briefly to the plan of operation, and I cannot do better in this conection than by giving the form of agreement between the department and the salesmen of the factories, covering the reception of cheese at the curing rooms.

DOMINION OF CANADA, DEPARTMENT OF AGRICULTURE, COMMISSIONER'S BRANCH.

COOL CHEESE CURING ROOMS.

Cheese will be received at the.....cool cheese curing room on the following conditions:—

The Department of Agriculture will undertake

(*a*) To collect the cheese free of charge to the factories.

(*b*) To issue warehouse receipts for the cheese as received.

(*c*) To store and take care of the cheese during the period of curing without any charge except as hereinafter specified, for a period not exceeding eight weeks.

(*d*) To keep the cheese fully insured.

(*e*) To provide boxes of good quality, box the cheese and ship them according to instructions received from the salesman.

The factories will be charged the usual price of good, ordinary cheese boxes delivered at the factory, and the cost of scale boards, nails, &c., used in preparing the cheese for shipment.

The Department of Agriculture will charge each factory a sum equal to the value of the weight of cheese saved on account of less shrinkage in the consolidated curing room, the amount to be determined by actual tests of shrinkage on the cheese of every weeks' make and the selling price. The factory will have full benefit of any increase in the price of the cheese per pound owing to the improvement in quality.

The Superintendent will not accept any cheese of inferior quality, poor finish or in unsuitable condition.

The Department reserves the right to refuse the cheese from any factory which fails to comply with the requirements or rules of the cool cheese curing room.

The cheese are to continue the property of the factory, and to be at the disposal of the salesman.

J. A. RUDDICK,
Chief of Dairy Division.

OTTAWA, April 8, 1902.

Approved (Sgd.) JAS. W. ROBERTSON,
Commissioner of Agriculture and Dairying.

On behalf of the I accept the above conditions for cheese delivered at the government cool cheese curing room at.....
.....

Salesman.

Date.....190

The curing rooms were not ready for use until the first of July, but from that time until September 30, cheese were received every week day, until the latter part of September, when they were collected only every second day. During these three months, 26,531 cheese from 37 factories were handled at the four places, divided as follows:—

	Factories.	Boxes.
Woodstock	9	11,657
Brockville	10	6,644
Cowansville	14	6,266
St. Hyacinthe	4	1,964
	37	26,531

If cheese had been received from the middle of May the number would have been nearly 40,000. The factories from which the cheese came are all located within about 10 miles of one of these curing rooms, and practically all the factories within that radius joined in the scheme. In fact, the only difficulty experienced in this connection was that the applications of several factories had to be refused. The number received at St. Hyacinthe was smaller than what was expected, because several of the factories in that district made butter instead of cheese. The capacity of the Woodstock curing room was rather overtaxed, handling 11,657 cheese in three months, while the others might have taken care of a few more. About 100 cheese per day, or between 11,000 and 12,000 cheese during that part of the season when cool curing is beneficial, about represents a good working capacity of these establishments. Special boxes were provided for carrying the cheese from the factories to the curing rooms. Two kinds were tried, one made of tin and the other of wood like an ordinary cheese box, only of heavier material and more strongly made. The wooden ones were found to be the more satisfactory, and cost only about one-third of what the tin ones did. They were

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made to fit the cheese snugly, and as for durability, I may say that out of 400 in daily use for the three months, not more than half-a-dozen have been broken.

THE SAVING OF SHRINKAGE.

As the cheese were collected from the factories, a number from the same vat from all the factories were set aside each week, and after being carefully weighed to two ounces, one was placed in the curing room and the mate to it was put in a room in the upper storey, where the temperature was not controlled. When the cheese of the corresponding week were sold, these cheese were again weighed as before, and the difference in shrinkage noted. From this difference the saving in shrinkage on the whole lot was easily calculated. Table I gives the details of shrinkage and temperatures for three typical lots. Table II shows the actual saving of shrinkage on all the cheese.

TABLE I.

Date Weighed.	Cool Curing Room.					Uncontrolled Room.					Shrinkage Saved.	
	Weight.		Loss.		Temperature.	Weight.		Loss.		Temperature.		
	Lbs.	Ozs.	Lbs.	Ozs.		Lbs.	Ozs.	Lbs.	Ozs.		Lbs.	Ozs.
Lot 1—Aug. 9..	80	2	...		54—56	82	0			61—77	0	8
Sept. 8..	78	6	1	12		79	12	2	4			
Lot 2—Sept. 12..	81	12		...	52—56	82	0	.	..	50—72	1	12
Oct. 11..	80	4	1	8		78	12	3	4			
Lot 3—Sept. 13..	85	4			52—56	83	4		...	50—72	1	1[illegible]
Oct. 11..	83	8	1	12		79	14	3	6			

TABLE II.

—	Cheese.	Lbs.	Percentage Shrinkage Saved.	Amount Saved.	Value at Selling Price.
				Lbs.	$ cts.
Woodstock	11,657	906,560	1·56	14,327	1,424 13
Brockville	6,644	526,950	1·52	8,050	814 48
Cowansville	6,266	494,296	1·34	6,640	662 62
St. Hyacinthe	1,964	143,190	1·66	2,386	238 41
Totals	26,531	2,070,996	1·51	31,403	3,139 04

If these figures are raised to what they would be if operations had been commenced at the middle of May, the value of the saving in shrinkage would be something like $4,500. This sum represents the interest at 6 per cent on $75,000, or in other words would provide for a capital outlay of over $2,000 for each of the 37 factories. This is certainly a low estimate, because, as everyone knows, the past season was remarkable for the very cool weather and moist condition of the atmosphere which prevailed all summer. In an ordinary season the saving of shrinkage would be very much greater, because a high temperature and a dry air are the two conditions that increase the shrinkage.

IMPROVEMENT IN QUALITY.

But the saving of shrinkage is only a minor consideration. The main one is the great improvement in quality. Altogether 480 pairs of cheese were set aside as already mentioned, for testing the shrinkage, one being cured in the cool room and the other in an uncontrolled temperature. These cheese are still in the possession of the Department, having been bought from the factories when sales were made. They have been examined and compared by a large number of cheese buyers, cheese-makers and others, and in *every case the cool cured cheese has been pronounced the best in quality*. Out of something over 500 lots of cheese sold out of the four cool-curing rooms, I have only heard of two lots of which there was any fault found with the quality. In one of these cases the cheese were sour, and in the other they had a bad flavour even when freshly made. There was some complaint about mould on the cheese at first, but this is another matter, and does not affect the question of cool curing.

THE EFFECT OF A HIGH TEMPERATURE ON THE QUALITY OF CHEESE.

Having the cheese from 37 factories to deal with, there were many opportunities for observing and studying the effect of a high temperature on the quality of cheese of different character.

The first effect of a high temperature, and one which is always noticeable, is to make the texture of the cheese rough and mealy, and in extreme cases show a greasiness which is undesirable; or in other words it destroys that silkiness of texture always present in cheese at its best. Bad flavours are intensified at the higher temperature, and many cheese go 'off' flavour, while their mates that are cool-cured remain sound and clean. All cheese become sharp and 'tasty' much quicker at the high temperature. Of course cool-curing will not make a fine cheese out of a poor one, but still cheese which are a little weak and open, or on the other hand have a little too much acid, show up better when cool-cured than they do when cured at ordinary hot weather temperatures.

Now this brings us to the question, what is a high temperature for curing cheese? Cheese-makers have, in the past, considered that their cheese were fairly safe as long as the curing room was not warm enough to cause the fat to exude from them, and yet it requires a temperature of about 74 degrees to make the cheese show grease on the surface. It is not many years since 70 degrees was recommended as a suitable temperature for curing. Careful observation on this point during the past summer has established the fact that positive injury follows, as soon as the temperature goes above 60 degrees. As a matter of fact, the temperature in the ordinary room at the Brockville curing room went over 74 degrees only on sixteen days during the summer, and on two days only did it reach 80 degrees. For the rest of the time it averaged about 70, until the last half of September, when it varied from 60 to 70. This record is very low, and in an average summer it would be about 10 degrees higher, but I mention it to show that the difference in quality and the saving of shrinkage which I have already quoted, is simply the result of curing cheese on the one hand at a temperature considered about right a few years ago, and comparing them on the other hand with cheese cured between 55 and 60.

MOULD ON CHEESE.

Some difficulty was experienced at first in preventing the growth of mould on the cheese, owing to the excessive moisture. There can be no ventilation without bringing air in from outside, and to do so when the outside air is warmer than that inside would only make matters worse, inasmuch as warm air that may be relatively dry, will, when cooled sufficiently, reach the point of saturation, and deposit moisture on all exposed surfaces. Under ordinary circumstances, if the warm summer air is cooled down to 55 or 60 degrees, it will become saturated with moisture; therefore, it is not only use-

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less, but highly undesirable to have a cool-curing room ventilated except when the ouside air is cooler than the inside. Of course there is always some outside air introduced into the best constructed buildings, but the chief source of moisture in these cool curing rooms, with their good insulation, was the evaporation of water from the cheese as they dried out in the curing. Our records show that 14,000 pounds of water, as represented by the shrinkage, was evaporated from the cheese in the Woodstock curing room during the three months of its operation.

The remedy for excess of moisture in a cool-curing room is rapid circulation of air, through the room and over the cooling surface, where the excess of moisture will be deposited. When the circulation is poor, the moisture hangs around the cheese from which it evaporates, and thus makes a condition favourable for the growth of mould. The ice cooling system provides for circulation, and as the air passes over the ice it is chilled and thus loses part of its moisture. In this way the large quantity of water coming from the cheese is constantly being disposed of. The relative humidity of the Brockville curing room remained fairly constant at 88 per cent and the cheese began to show signs of mould after being there about a week, just as they do in many of the cheese factories.

It is desirable that the cheese should be free from mould, and we do not look for any trouble on that point hereafter. There is always a tendency for mould to grow in a new curing room, and it is not likely that we shall have another season for some time with as high relative humidity in the atmosphere as there was last summer. Moreover, some measures are to be adopted to ensure the cheese being drier on the surface when delivered at the curing room. It was noticed particularly that certain cheese that were delivered to the curing rooms with wet surfaces were always first to show signs of mould.

THE CEMENT CONCRETE FLOOR.

The cement floor is an essential part of the plan of these cool-curing rooms. It necessarily lies on the ground, and being a good conductor of heat, its surface has a constant temperature of about 50-58 degrees, according to locality and the character of the earth immediately underneath it. It requires no argument to show that the cement floor is a great aid in maintaining an even temperature of 55 to 60 degrees in any room where such construction has been followed. It would appear to be a very fortunate thing that the cool cheese curing temperature and the natural temperature of a cement floor are so close together. As an evidence of how the cement floor keeps the temperature down in a well insulated room, I may state that the cool air from the ice was not turned on at the Brockville curing room until July 8, and the temperature never went above 60 degrees, although it went as high as 76 in the room upstairs, and about 1,000 warm cheese had already been placed on the shelves up to that date. On the other hand, the temperature in this curing room did not go below 50 until November 22, when it gradually dropped without fluctuation, to 42 degrees on December 10. On the same date the thermograph in the room upstairs registered 10 degrees, and the outside temperature was 20 below zero. This is not important except in showing the controlling effect of the cement floor. In future construction of cheese factories and creameries there should be no question about putting in cement floors, except in butter refrigerators, where the concrete requires to be insulated.

CONCLUSIONS.

Before concluding these remarks I may be permitted to make some observations of a general character bearing on this question.

One cannot estimate the great benefit that would accrue to the Canadian cheese industry at large, if all the cheese were cool-cured. We have in the past season a most excellent illustration on this point, inasmuch as the comparatively slight improvement in quality due to the unusually cool weather which prevailed all summer, had the

effect of encouraging consumption to such an extent that the demand forced prices up to a point that few ever expected to see again. The situation suggests possibilities in the future of the industry that are certainly very encouraging.

In regard to the central or consolidated curing room idea, I would like to point out that the Department does not urge the general adoption of this scheme. I have already mentioned the reason for the establishment of those now in operation. If they are the means of convincing those engaged in the trade of the necessity for adopting some plan of cool curing, their object will have been attained. The desired result will probably be reached in different ways, according to local circumstances and conditions. The larger cheese factories will, I think, be inclined to make the necessary improvements in connection with their own buildings. Already a number are preparing to do so.

Combination, or consolidation, may be affected in some cases, but the jealous rivalry which exists among factories stands in the way. It is probable that the exporters themselves may in the future have something to do with the curing of some of the cheese.

I see one obstacle in the way of getting improvements made in proprietary concerns, and it is this: Nobody needs to be told that any saving of shrinkage or enhanced value in the cheese will go directly into the pockets of the patrons, and very little of it will stick to the fingers of the manufacturer. It is hardly fair, therefore, to expect the man who owns a factory to meet all the expenses of improvements from which he will receive no benefit, especially in view of the fact that the commission which he receives at present is not sufficient to provide decent buildings and proper equipment, and at the same time leave a reasonable margin of profit. If patrons desire this increased revenue, and there is no doubt they do, they must be willing to make concessions to the factory owner to get it. Patrons of cheese factories should pay a fair price for making and then demand the best possible service in return.

IMPROVEMENT OF SEEDS AND SEED GRAINS

HOUSE OF COMMONS,
COMMITTEE ROOM 34,
WEDNESDAY, April 15, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock, a.m., Mr. Douglas, Chairman, presiding.

Mr. J. W. Robertson, Commissioner of Agriculture and Dairying, was present by recall and examined as follows:—

WINTER STABLES FOR DAIRY CATTLE, AS TO FLOORS, &C.

By Mr. Erb:

Q. I think it would be well, Mr. Chairman, before Professor Robertson goes on, that members of the Committee should have an opportunity of asking some questions on his previous evidence. While listening to him the other day, I was struck by a statement of his as being very peculiar; and to make sure I did not misunderstand him I looked up the evidence as taken down by the reporters. I found this statement at page 24 of the evidence: 'That is one thing that has prevented the success of winter dairying, the want of cement floors to keep the stables warm. When we have cement floors generally we shall have a large expansion of winter dairying in Canada.' I have thought it well to refer to this, for this statement I think is remarkable. I can well understand that warm stables are better for milk production than cold stables, but that a cement floor is I cannot see. From my experience I cannot accept that, conditions being the same, and I would like to have the Professor's explanation of it.

A. Two conditions are essential to profitable winter dairying in Canada with its climate. One of these is succulent feed for the cows and the other is warm stables; these would make the conditions as nearly like summer conditions as is practicable. Now in making cool curing rooms for cheese—this will illustrate the point—in making these cool curing rooms we put in cement floors for the purpose of getting the cooling power of the earth on the interior of the rooms, the earth being anywhere from 52 to 46 degrees of temperature. The cement floor is a conductor, not an insulator; it conducts the heat out of the room into the earth in summer and would conduct the heat of the earth back into the room in cold weather. In each of the rooms so constructed we placed thermographs; that is a self-registering instrument which keeps a continuous register of the temperature, being wound up once every fortnight. In these buildings we had no fires, except perhaps in the office; and in these buildings, closed in, we noticed that the winter temperature was never below 40 degrees, even when the temperature in one case was 22 degrees below zero outside. We were getting the heat of the earth back into the room. We have been using wood for the floors of our stables in Canada, and thus have insulated the heat of the earth from the stable. You will find in many stables with wooden floors that the manure in the stables is frozen. With a proper cement floor you would have no trouble in keeping the cow stable at 55 degrees all winter. You would get fresh air by ventilation. I have great faith in cement floors for our dairy stables.

Q. Well the statement as given in the report, by itself, I think would lead a person to think the virtue lay in the floor only, without reference to other conditions. I agree with you that if the walls are warm, if the whole stable is warm, cement floors

are all right, but I claim that it will be just as warm if the floor was of wood or paved with stone.

A. If paved with stone, yes.

Q. I have my cattle stables paved with stone and see no difference in the result. When I had a cement floor put in I did not see that the cement makes any difference. If the stable is warm otherwise I cannot see that it makes much difference what material a floor is made of.

A. Let me make one more statement. In carrying on winter dairying it becomes necessary to have the stable kept clean and kept clean permanently. I have had stables with a wooden floor and I have found, like every one else, that one of the difficulties is to save the liquid manure and to keep the stable in a thoroughly sanitary condition. It is all right if you are only fattening the cattle; but if you are using them for dairy purposes the stable must be kept absolutely clean. When we made the discovery, it was to me a revelation, that in a climate like ours the temperature should never go below 40 degrees in these unoccupied big buildings without heating. I said to our live stock commissioner lately, 'I want you to look out for three cattle stables and arrange for a real investigation and object lesson along this line.' Next winter we hope to have these in different parts of the country, where a comparison can be made with thermographs running in the stables, one stable with an ordinary floor and one with a cement floor. This can be arranged without any expense to three farmers who want to improve their stables and who are willing to keep these thermographs in the stables under the different conditions, giving us a record of the results.

Mr. SPROULE.—Don't you find the cement floors are often detrimental to cattle owing to their slippery condition?

Mr. ERB.—That depends on how they are finished; you can get them rough finished.

By Mr. Sproule:

Q. You want to get them very rough finished.

A. The passages should be rough finished and the gutters quite smooth. Let me make one further observation before we leave this matter. There was an idea that cement floors conduced to rheumatism in cattle. I know it has been claimed that this has occurred in the case of pigs, but I do not think there is any ground for saying that anything of that character affects cattle owing to their stables having cement floors.

By Mr. Erb:

Q. All people who keep cement floors have put lumber on top after using them for some time without wood.

A. I know one stable used for pigs where they have the sleeping place floored with wood over the cement, but it is the sleeping place only; the other part of the floor is without wood, and by this means your pig pen is easily kept clean.

IMPROVEMENT OF SEEDS AND SEED GROWERS' ASSOCIATIONS.

Mr. Chairman, the matters I propose to bring before the Committee this morning, are on the improvement of seeds and the organization of seed growers' associations in Canada for the purpose of improving the grain crops of the country. In growing crops—if I put in a parenthesis here and there I shall not detain the Committee long by preliminary explanations—in growing crops two main matters are important; first, the ease or difficulty with which the plants can obtain their food from the soil and from the air—in other words, the environment of the plant, or its opportunities; the other main matter is the power of the individual plant to take in, absorb and assimilate food from the soil and the air—the power to overcome obstacles, the personal ability of the plant to do things in its own environment. I need not say that these two great principles condition our progress—opportunity and personal power. Even in human progress the principles are persistent; and governments are concerned with these, with

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their preservation and their enlargement. Plants and animals are nourished by processes that may be considered in three different stages. In animals we speak of the processes as digestion, absorption, assimilation. Digestion is the process of making soluble, absorption is the process of taking into the juices or fluids of the body, assimilation is the process of change into the structure of the body or its fluids. Plants are nourished in a similar way. Plants take nothing in through their rootlets that has not been previously digested, that is, made soluble. Nothing enters a plant except in either a soluble condition through the roots or in a gaseous state by the leaves. So there is digestion of all crude plant food before it goes into the roots of the plants; after that it enters into the juices of the plants and is absorbed, then it is assimilated and moved about afterwards to different parts of the plant. As you know, plants take in food in a liquid form through their roots and in a gaseous form through their leaves. All the starch, the carbohydrates that form the bulk of their weight, comes in through the leaves. It is not taken out of the soil to any extent at all. Plants largely feed in and on the atmosphere; but they take things out of the soil in a partly digested state. It will be sufficient to make a few observations on some of the sources of food substances before I speak of the large bearing and sweep of this matter of organizing seed growers' associations.

THE RESULTS FROM BACTERIA IN SOIL.

The source of food materials: soils are composed of broken down rocks, some are clay, some sand, and some gravel, or mixtures of all three mixed with broken down organisms, such as leaves, stems, roots, bones and bits of leather. These two make the soil—broken down inorganic matter and broken down organic matter. As I very well know, many members of the Committee are not professional men and words, and the ideas they represent, are sometimes unfamiliar when used in a new connection. Organic matter is only matter that has once formed part of an organism that lived; it may have been a tiny so-called micro-organism, or it may have been a very large tree. Soil is made up of broken down matter; inorganic matter that has never lived in an organism; and organic matter, the remains of what has once lived. With these materials must be some water in order that they may be made soluble and in a fit state for the rootlets to take them in; and with these three—inorganic, organic and water—must be living organisms to carry on the work of preparing the organic and inorganic matter and water into food materials suitable for the sustenance and nutrition of plants. These organisms are not well understood by farmers. It is only of late years that anybody has understood their manifold functions and use; but crops never grow except as preceded by the labours of these organisms, in preparing, in practically digesting, food substances for them. We need to know more of these things. This is one of the new things that is dawning on agriculture and is bringing not merely pleasure and interest into the work, but an increased power of producing good crops and maintaining the fertility of the soil. If you take a portion of soil and heat it so as to destroy the life of these little organisms it will afterwards carry only a very few crops. The plant food that has been liberated by the organisms is there in only very small quantities; and as soon as that is exhausted the land is absolutely barren, until myriads of lowly forms of life come into it again to make the raw material which it contains fit for the use of the crops. That has been proven many times. It is not enough to have substances—ingredients of plant food—in the soil to nourish the plants, but to have them in a suitable condition, partly prepared for the plants to use. Now that plant food is being continually prepared in the soil by the action of bacteria or soil germs. There are series of changes going on, partly chemical and partly physical, as a result of their life and of their activity. They digest the crude plant food. They are the cooks of nature that prepare the food for the higher forms of living things, primarily, because the higher life lives on the things that they prepare. How can you make the conditions favourable for their multiplication and beneficial activity? Let me give you one instance—take an orchard that has been in sod for a great many years, and if you

have an examination made of that soil you will find less than one-twentieth as many soil bacteria in it as if that land had been ploughed up and cultivated for a couple of years. The reason is that the sod land does not afford favourable conditions for their multiplication; by actual examination, sod land like that contains less than one-twentieth as large a number of bacteria per cubic inch as is contained in the land after being cultivated the second year. Everybody knows that if you plough up the sod in an orchard the trees take on greater vital activity, they produce better crops and they make a better growth of wood, because nature's cooks are preparing, out of the materials found in the soil, food for their use. The value of those lowly forms of life in all the fields of this country is what I am trying to impress upon the Committee.

Again, they do not thrive very fast in wood land. If you have land that is what is called slightly sour, they do not thrive in land like that. But a very light dressing of quick lime will change that land, it will neutralize the acid in the soil to the extent of making the soil fit for these things to live in and to multiply; and they will multiply, multiply and make the land fertile, not by increasing the quantity of the substances of plant food, but by altering the conditions so as to make the food soluble, and ready for use.

It has been the practice in the old countries to put a compost dressing on the fields. Thirty years ago I remember helping to make them as a lad on my Saturdays out of school. How are they made? So many cart loads of dust or scrapings from a well travelled road, so many cart loads of sods, and so many bushels of lime all mixed up. The constituents are well mixed, left at rest for a time and mixed over again once a week, and then the compost is scattered thinly on the land.

Some years ago I had sent to me from England a formula for the making of compost that was said to be over 250 years old, and to come from Somersetshire, famous for its dairy products. The formula was to take so many cart loads of dust from the highroad, so many loads of turf, and so many bushels of lime, make them into a heap and turn them over twice or more. When such a compost was put on the land it was said that it made a tremendous difference in the crop. I showed the formula to an eminent chemist, who after examining it said it was worth nothing, that it was like the old superstition as to the virtue of killing pigs in certain phases of the moon. And yet there was the experience of 250 years, as shown by the traditions and records; but he said the formula did not add anything to the land but lime, and that did not count for much because the land might have it already. On the other hand, take a man who has studied the lower forms of life and wants to make a culture of soil bacteria; what does he do? He may take sod and dust—and there is nothing better than road dust—and put in some lime. He will make a culture—what the dairyman would call a 'starter.' This old Somersetshire compost was a culture, a starter, promoting the growth of low forms of life that would work like Trojans in preparing soil food for plants.

Moreover, there are other forms of bacteria which increase the productiveness of land in quite another way—which add to the nitrogen content of plants and soil by fixing nitrogen direct from the atmosphere.

I have seen men with a wagon take three bags of earth from one piece of ground to sow on another piece of ground that would not grow clover; and the following year the clover grew luxuriantly. In taking this earth from the one piece of land to the other the men were seeding the land to which the earth was taken with bacteria. Sometimes if clover will not thrive the first year it will do better the second year; the reason for its not doing so well the first year being that the low forms of life were not abundant enough, or perhaps that the particular germ which lives in clover roots was not present in the soil. If you pull up clover and examine the roots you will find little nodules or tubercles containing low forms of life. These low forms of life are an agency by which the land is made rich by taking in free nitrogen from the atmosphere. An eminent French chemist is reported to have made cultures of soil bacteria which have enriched the land in nitrogen content, apart from the growing of clover. What is the possibility of this thing?

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I have seen the difference in the crops from soil treated that way in the case of soja beans—on the untreated soil giving crops 12 inches high, and on the soil after inoculation giving crops 32 inches high. The field that gave the poor crop, after being sown with three bags of soil from the good field, gave an excellent, heavy crop. The wonderful power of these soil bacteria is only beginning to be known, although the fact itself has been in existence since the world, as we now know it, began.

By Mr. Ross (Ontario):

Q. Can you see these bacteria?

A. Under the microscope only. On clover and beans, however, you can see the tubercles or small wart-like growths produced by the bacteria. The bacteria are believed to grow as little filaments into the rootlets, and then begin to make the nodule or tubercle—a little thing sometimes as big as a pin head and sometimes as big as a pea; you can split these open with a knife or your thumbnail; they contain soft matter almost like proud flesh, but that is not the bacteria.

Q. Have the bacteria any particular shape or form?

A. Sometimes they are round and some are in the form of rods. As I have just mentioned, an eminent French chemist, Bertholet, has found one that can take the nitrogen from the air into the soil without the interposition of the plant. He has been able to find as much as 980 pounds of nitrogen per acre fixed under laboratory conditions.

THE CHARACTER OF SEEDS.

I will now speak of the power of the individual plant to first of all take in, then to absorb and then to assimilate the food it gets prepared in that way. There are in plants again two processes of increase. I have spoken of the process of nutrition being by three stages. There are two processes of increase in plants, the increase that makes for the enlargement, the maturity of the parts of the plant that die—the root, the stem and the leaves, parts that die utterly at the end of the plant's life; and also the process that makes for the increase in the size and maturity of the seed part of the plant, that does not die at the end of the plant's life, but which carries the life over into the next generation. The seed that carries the life over is itself a tiny, an embryo, plant, and a store of food. In some seeds you can, by having them softened and swollen a little, almost see the beginning of the plant itself in the embryo and the store of food close by ready for the nourishment of the young plant when it starts to grow and before it is quite vigorous enough to get nourishment through its roots and leaves.

If the embryo is imperfectly formed or weak it cannot thrive well; therefore, any seed that is only partially ripe, not wholly matured, is a poor kind of seed to sow on land. You know that is the condition of frosted wheat and frosted oats and all that. If the seed is not completed by perfect maturing and ripening, you have a poor seed even if it is of a highly priced sort. If the seed be very small for the variety, there is apt to be only a partial store of food close to the young plant when it is beginning its life. That is why a very small potato set is a mistake. If you have a very small set there is not enough to nourish the potato until the roots and leaves increase enough to take in its own nourishment. A seed has to be considered both in regard to its maturity, and its size for the variety. The selection of seed does not receive anythink like the care that it should, or would if farmers knew the meaning of these things of which I have spoken—the preparation of the food within the soil and the ability of the individual plant to get hold of that food and make good use of it. A good many farmers buy whatever seed is cheapest and trust to luck. That is the straightest road to failure a man can follow.

ON THE BUYING OF GRASS AND CLOVER SEEDS.

May I say only a few words about other things to consider in buying or procuring seeds? First of all one has to see that the seeds are genuine and what they are represented to be. Then one has to see that the seeds are pure, because it is not an uncommon occurrence at this time or in Canada, for a farmer to buy grass or clover seeds and find that he has seeded down his farm to weeds of the most pernicious and persistent sort.

One has also to make sure that the seeds are vital, and have adequate germinative energy. It is not uncommon to have seeds of grasses mixed with old seeds that are dead and have even been slightly oiled to make them look fresh. Sometimes seeds are adulterated with sand, which, however, is harmless enough and is only costly in being sold under false pretences for the price of seeds.

Last year, as this question had been pressing on us for a good while, I directed Mr. Clark, who is now the head of the seed division, to make a collection of seeds of Red Clover, Alsike and Timothy as sold by retail all over Canada. We enlisted the assistance and interest of members of farmers' institutes and farmers' institute workers and many other leading agriculturists. We obtained altogether 513 samples by actual purchase in seed stores and other stores all over this Dominion. We had them come to our seed laboratory here with the name and address of the person they were bought from, the price per pound or per bushel, and all the rest of the information in the package with the seeds; and then we had them analysed for both purity and vitality. A very useful bulletin by Mr. Clark has been published on that subject, and I think it is one that should be read, especially by members of this Committee, because I think it is the intention of the Minister of Agriculture to bring a Bill before the House dealing with this matter as affecting the prosperity and conditions of agriculture in Canada.

DOMINION DEPARTMENT OF AGRICULTURE—SEED INVESTIGATION.

Place where sold.	Price per Bushel.	Per cent of Pure Vital Seed.	Cost of Pure Vital Seed per Bushel.	No. of Weed Seeds per Pound.
Red Clover.	$ cts.		$ cts.	
Ottawa	7 80	86	9 07	5,535
Kemptville	7 20	73	9 86	10,350
Caintown	7 20	93	7 75	9,180
Carleton Place	7 50	93	8 06	1,035
Pembroke	7 20	85	8 47	9,360
Renfrew	7 20	67	10 74	36,990
Alsike.				
Ottawa	9 60	81	11 85	2,265
Kemptville	10 20	82	12 43	3,715
Mallorytown	8 40	53	15 85	9,785
Carleton Place	7 20	65	11 07	8,879
Pembroke	10 80	72	15 00	14,528
Renfrew	10 20	80	12 75	3,533
Red Clover.				
Barrie	7 20	90	8 00	1,170
Hamilton	5 50	86	6 39	5,715
Brantford	5 25	72	7 29	13,005
Toronto	6 60	95	6 94	
Galt	5 90	90	6 55	5,985
Galt	5 75	96	5 99	1,440
Alsike.				
Barrie	7 20	78	9 37	2,718
Galt	9 00	62	14 51	23,556
Bradford	11 00	94	11 70	272
Toronto	9 00	90	10 00	1,903
Brantford	8 00	48	16 66	49,830
Hamilton	8 50	65	13 07	1,993

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Now if you observe that chart—one half of it applies to eastern Ontario and the other half to western Ontario—you will see that the sample of Red Clover bought at Ottawa at $7.80 per bushel contained 86 per cent vital seed. Therefore the cost of the pure vital seed was $9.07 per bushel; and the sample contained 5,535 weed seeds in every pound.

By Mr. Ross (Ontario):

Q. How many seeds are there to the bushel in Red Clover?

A. I think about 350,000 to a pound. I have not the exact figure in my mind.

Q. 14 per cent of that would be weeds and 86 per cent pure seed?

A. No, there would be some dead seeds you know and some seeds or other useful plants. The weeds would amount to 5,000 out of every 350,000, or one weed for every seventy clover seeds. We had the number of weed seeds put there to show this. If one sows 12 pounds to the acre of this Red Clover seed bought in Ottawa he would seed 66,000 weed seeds per acre. This is the appalling side of it. If you take the next sample it would be still worse ; and worst of all if he were sowing seed like the last sample, from Renfrew—it was found to contain nearly 37,000 weed seeds per pound, to be exact 36,990 seeds of weeds per pound of what was sold as clover seed. The actual value of the pure vital seeds as shown in that other column would be for that Renfrew sample $10.74 for each bushel; but with that seed, when the farmer sowed it, he would sow on his farm, even if he only used 10 pounds to the acre, 369,900 weed seeds to the acre. One year's seeding and seven years of weeding in very fact. There is a striking fact for the farmers to consider.

By Mr. McGowan:

Q. Is there no remedy under the existing law?

A. The Minister of Agriculture intends to bring down a Bill to parliament this year to remedy this.

By Mr. Ross (Ontario):

Q. Are these vital weeds?

A. Yes, we tested many of them.

Q. Some of them objectionable?

A. Yes, very.

Q. Any of them harmless?

A. I would not call any of them harmless.

By Mr. Robinson (Elgin):

Q. How many varieties did you notice?

A. I could not give you that, but I know that we found only five or six samples over the Dominion out of the 513 we bought that were free from weeds. In some distant parts of the Dominion, remote from the source of supply, we found seeds hardly anything better than screenings being sold to the farmers. Now it is exceedingly difficult for anybody by a simple examination of seed to tell its quality. Even expert seedsmen cannot tell by merely looking at them.

By Mr. Ross (Ontario):

Q. Can you tell us the process of testing this seed?

A. Yes. We have first of all the sample of the seed to be tested thoroughly mixed; then a small portion of that is taken for examination.

Q. One pound?

A. Oh, no, a small quantity will do, usually about ten grammes. The portion selected is spread out on paper of a colour to suit the seed; and girls who are trained in the work separate the various sorts of impurities from the real seed. Then the latter is weighed and that gives the per cent of pure seed. Then 200 seeds of that are put in

a germinator and tested as to their vitality and 200 more are put in another place. We do it always in duplicate. This gives us the percentage of vitality in the seeds. Then an expert examines and classifies the weed seeds which have been separated in the first place by the girls.

Q. What is the germinator like?

A. It is an apparatus made of copper and surrounded by a water jacket two inches in thickness; that is kept at the proper temperature by a little gas flame which is gauged by a gas thermoregulator. Little trays are run in, and on these is placed the seed between folds of blotting paper moistened every day; the test lasts from three to five days for a preliminary test, and in some cases fourteen days for a final test. You will find that fully described in the bulletin of which members can have some for distribution. That is why I do not take up the time of the Committee to explain details this morning at any greater length. In this proposed Bill, which it would not be well to discuss to-day, but which I hope will come before the Committee, the intention is to forbid entirely the sale of seeds for seeding purposes if they contain any of twelve of the worst weeds in Canada. That is in practice in the North-west Territories now in regard to cereal seeds. The Bill totally forbids the sale of any seed for seed purposes that contains any of twelve of the worst weeds that are named. Then it enacts that all seed offered for sale for seed purposes should be graded and sold in grades under recognized standard grade names.

Q. Graded by whom?

A. The Bill itself provides for that, according to the standards in the Bill. For instance to-day a man will have three grades of seed, one of which he calls 'Reindeer,' one 'Fox,' and another 'Dog.' Another dealer will sell the same grades of seed in three grades which he calls 'Whale,' 'Shark' and 'Herring,' names that mean absolutely nothing as applied to seeds. Now it seems to be the opinion of the men who have given this most thought that everybody selling seed should be compelled to grade it, under at least one of four well recognized and defined grades: Grade No. 1, grade No. 2, grade No. 3 and grade No. 4, or screenings. Grade No. 1 must be free from certain named weeds, and must contain not less than 90 per cent of the pure vital seed of the kind that it is represented to be. Grade No. 2 must be free from some weeds named—not so many named as for grade No. 1—and must contain not less than 80 per cent of pure vital seed. Grade No. 3 must be free from still fewer weeds and contain not less than 70 per cent of pure vital seed. Anything under 70 per cent of pure vital seed of the sort described, must be graded as No. 4, or screenings. Then any farmer buying seed and wishing to know whether it is up to the grade represented, may send a sample to the seed laboratory here, and have it tested for him by the department.

Q. Do you think that is reasonable for the trade?

A. Very reasonable, and if the trade will co-operate with us it will be to the mutual advantage of the seedsmen and the purchasers.

Q. What would be the average of good seed in those samples of red clover there?

A. You mean these samples we have been speaking about, purchased in eastern Ontario?

Q. Yes, what is the average of them, about 83 per cent I think?

A. About that of pure vital seed. Then let me say this further. That is not the average of Red Clover grown in Ontario or in Canada, but the average of what we bought. The very best clover seed grown in the country is cleaned thoroughly and sold out of the country in markets where they have regulations and restrictions and where farmers would not buy poor seed at all; and in some instances, I am sorry to say the screenings are scattered over the farms of Canada. If the law would compel seedsmen to burn all that rubbish that contains weeds, the country—if need be—could pay fifty prices for it and then get off cheaper than by letting it get sown.

Q. Who would grade these seeds?

A. The seedsmen should have them graded.

Q. A great deal of the seed is sold in the country by the merchant to the farmer, and the merchant has no appliances for testing.

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A. Any one could send a specimen to the laboratory here and get a preliminary report of the result in four or five days.

By Mr. Cochrane:

Q. For instance, I raise clover seed, say, and sell it to a merchant at Brighton and he sells it to the farmers, who did not raise their own seed. They purchased it. How could I grade that seed on the lines of the Bill you propose?

A. Either the grower or the man who buys from the grower, to sell again, would take some representative sample, put it in a small bag, send it by mail—it comes free—to the seed laboratory here; and in a few days he would get back an exact statement of the percentage of purity and of the vitality.

By Mr. Robinson (Elgin):

Q. It is a very difficult thing to clean the weeds out of the clover seed is it not?

A. It is difficult; but it will lead to this good practice I think, that by and by growers will 'rogue' their seed fields as it is called, that is they will go through and pull out the weeds while the crop is growing.

Q. There is no sieve made that will take out all the weed seeds?

A. Not all the weeds. There are so many different sizes and weights. I mention the matter of this Bill because I have the authority of the Acting Minister of Agriculture for saying that while the Bill has not yet been introduced, it is more than likely that it will be referred to this Committee; and on that occasion, if the Committee desire, I should be glad to come to the Committee and discuss that Bill with them. I mention this now so as to attract the attention of the Committee to the subject.

By the Chairman:

Q. Practically we have the principle involved in this Bill applied to grain in the north-west, to the inspection of grain.

By Mr. Thompson (Grey):

Q. Grain is a very different thing from seeds.

A. The price paid is according to the grade, and when there is a dispute about the grade it is referred to the Government Inspector. There is no difficulty in getting judgment in a couple of days.

By Mr. Cochrane:

Q. If the law is made so that the seed would have to be graded, that would all have to be done before it is sold.

By Mr. Ross (Ontario):

Q. Did you say you could take the weeds out of the clover field?

A. That is done now very often; it is the easiest and most effective way.

By Mr. Lennox:

Q. Does that chart show the prices prevailing in the different places named at the same time? For instance, at Barrie $7.20 was the purchase price, while at Bradford, which is only a few miles distant, the price is quoted at $11. Were these the prevailing prices at these places at the same time?

A. This is for alsike and that is for red clover; it is different seed you see.

Those were the prevailing prices practically at the same time, because the collection of seed was made in the spring, all about the same time.

IMPROVEMENTS BY SYSTEMATIC SELECTION.

I would like to speak about the large seeds, that is the seeds of cereals, and the use of seed growers' associations to improve those seeds in Canada. The systematic selection of seeds means the selection according to a system, and that a system planned and applied with intelligence. Some plants have greater power to overcome obstacles than other plants, as some animals have greater power in that respect than others. And the characteristics, like those in animals, are transmitted from ancestors to their descendants. That is the meaning of the breeding of improved horses, cattle and other domestic animals. Characteristics are inherited by plants from their ancestors; that rule of life seems to run through the whole range of living things. In animals and in plants also there is a constant variation; it seems as though all nature was making an effort to fit in, to fit into conditions, into environments, and therefore modifying itself a little in that effort. If you have crossed the plains you have seen the long legs and running shape of the plains Indian; and if you have gone to British Columbia and watched the fishing coast Indians you have seen the short legs, the big trunks, and the strong arms that are required by fishing men. Anybody can tell by looking at the two what occupations their ancestors have followed for many generations. If you have watched the Clydesdale horse, you have seen the comparatively straight shoulder, the great weight and thick muscle; and if you have seen the race horse, that can come down the track at the Derby and come in first, you have seen the fine tough bone, the hard sinews, the sloping shoulders, and the relatively great girth of heart. That is the result of the effort of nature to fit in to the style of life that had to be lived.

There are many causes of variation. If you cross a Thoroughbred stallion and a Clydesdale mare, you can never tell what you will get; which character will prove the prevailing one. You can bring about variation, but you can not tell which way the variation will go; and nobody can tell yet. Once there was a man named Mendel, who lived some forty years ago, an obscure and quiet life, and who discovered one of the laws of transmission; we have discovered it and him again now, making him one of the great discoverers of Europe. Mendel's law of life laid down the principle that in cross-breeding of some plants certain definite characters of parent seeds will come out in certain definite proportions in the hybrids.

If you change the supply of food you cause variation; and a change to different conditions of climate brings about variation also. These are the three main causes of variation: the crossing in breeding, the changing of the supply of food, and a change in the conditions of climate. Moreover, if you do not change any of these, you still have a tendency to variation inherent in the life of the plants themselves. The intelligence and skill of selection for breeding is determined by the ability to recognize the characters, the good qualities that are wanted, and by the skill to select individuals for mating that have these good qualities and can transmit them.

SELECTION OF SUGAR BEETS.

Let me give you an illustration. In France and in Germany sugar beets now produce twice as many pounds of sugar per acre—twice as many pounds of refined sugar per acre—as they did before the improvement of the sugar beet was undertaken in a systematic manner; that is with the same soil, the same climate, and the same kind of fertilizer; and the result is twice as many pounds of sugar per acre. That work was begun by Vilmorin, of Paris, three generations ago; his grandson is at the head of the business now, and the system is also practised in Utah by the Mormons. The sugar beet growing there could not succeed at all if the practice was not kept up continuously.

First of all a field of sugar beets is taken and the finest beets of smooth shape, well formed and of medium size are selected, those that average from 1½ to 2 pounds. These choice specimens of the root are harvested and kept in a cool place until spring, when they are planted. You know the sugar beet is a biennial, growing what we call

the beet root the first year from seed, which root being planted the next year yields seed; that seed is sown for the crop of beets for sugar making. These selected beets then are stored in a cool place; and before the time for planting a small core is taken out of each beet; the juice is pressed out and that is tested for the percentage of sugar and purity. All the beets that test over 15 per cent of sugar are put by themselves; and all that test above 16 per cent are put in another lot. These are the two sets of mother beets. These are planted under favourable conditions, with plenty of room. The seed from each beet, each mother plant, is sown in a separate row. The grower finds which row gives him the best value of beets in total yield, in weight per beet, in shape and position of growth and in percentage of sugar and purity of juice. Out of the rows that give the highest general average the best beets are picked again. These are tested again for sugar content and purity and these become the mother beets of the third year. Their seeds are again planted in separate rows and the seed from that crop is sown in the general field. The sugar beet growers keep up continuously the practice of having seed from the best mother plants. By that process the sugar content of the sugar beet crop has been raised from about 9 or 10 per cent to between 15 and 16 per cent all over France. That is the result of systematic, intelligent selection of the best plants and the use of the seeds from those plants continuously year after year.

However, beets cross-pollinate. The pollen from one row of beets will cross with those of others. The growers adopt the plan of planting mother beets where only the good beets can cross-pollinate with each other.

SELECTION AS APPLIED TO INDIAN CORN.

There has been an almost similar method of improvement applied to the Indian corn crop. Some four years ago, when I gave evidence on the same subject, I cited the case of a grower in the United States who had increased his yield of Indian corn 25 per cent by four years of such selection. I have been following that subject ever since with increasing interest, and I have seen the most astounding results, if I may use that word, from that procedure. Only last year there were formed in Illinois two corn breeders' associations, to carry out in a commercial way the very practice I advocated here in 1899, applying it to Indian corn. The growers choose for this purpose—and since we grow a good deal of corn in Canada, in southern Ontario, it is important to our country—they choose seed ears with reference to the individual character of the plant on which the ear is produced. That is one of the rules. The plant used must be representative as an excellent, superior plant of the variety. Then they choose the ears that conform to certain standards in regard to length of ear, diameter, closeness of grains and the ear being covered to the very tip with kernels of corn. I obtained from Illinois last year—I went there to see this in some special places—some corn ears that were covered with kernels right over the end.

By Mr. Ross (Ontario):

Q. You could not see the tip?

A. No, there was a grain of corn right in the very end. But such improved corn will go back in a few years unless the systematic selection be kept up. Every sort of grain which has been improved by cultivation and selection will degenerate unless kept up by selection.

Q. Is that a tendency of all plant life, to change?

A. Yes, to vary both ways; and the variation of improved varieties is likely to be backward unless continuous intelligent selection is kept up.

These corn breeders' associations require each of their members to have a breeding plot. Each such plot must have not less than 25 rows of corn by 100 hills long; each separate row planted with kernels from only one selected ear. For their stock seed, they go through the rows, as the other growers go through the sugar beet rows. They see which row on the average gives the best crop. If any row shows inferiority they

must detassel the plants of the whole of that row before they flower, and so prevent cross-pollination. The seed ears from the row that shows the highest yield and quality are taken for the 25 rows or more of next year's breeding plot; and that plan is kept up continuously. The few great corn growers in the United States who have had their names attached to special varieties, have been quietly doing similar work for years, and now the system of selection is being organized for general application. There is a limitation to the extent of the selection of rows. Any one with a breeding plot is not allowed to take from more than 40 per cent of the rows for seed. The limit is 40 per cent, evidently because there is a tendency downwards.

By Mr. McGowan:

Q. Are they doing anything of this at the experimental farm?

A. I think they began it there two years ago.

Another matter of very deep interest to me and also to the country I think, are the facts brought to light by an effort begun at the experiment station in Illinois some six years ago to improve the quality of Indian corn in this way. They had analyses made of the very best corn they could find for a high percentage of protein. They found the good corn contained about 9 per cent of protein. Wheat contains from 12 to 13 per cent of protein. Then they planted rows from the ears that had the highest percentage of protein, and last autumn they had some corn growing in a plot that showed an average of over 15 per cent of protein, or 2 per cent higher than that of wheat. That is an amazing achievement for this continent; for if you have Indian corn richer in protein than wheat, what an immense benefit and advantage it will be in the feeding of cattle, the production of bacon and even in the nourishment of human beings from the cereal direct.

SELECTION OF SEED AS APPLIED TO CEREAL CROPS.

Let me now come to another part of this subject, one that we have been working out in Canada for the past four years. I think we are now ready for a great advance in it. In 1899 I said in my evidence before this Committee:

'The safe practice for the farmers is to select large and heavy seed from any strain which is of good quality for the market, and which has been productive in their locality. A still greater improvement than that is practicable. The selection of seeds from the largest, earliest, most vigorous plants as they grow would give the very best seeds from that strain or variety. The power to overcome obstacles, which is in evidence in the largest and most vigorous plants, is worth seeking in the seeds from such plants.

'One day's work of selection when the crop is ripe would yield the farmer enough heads from the best plants for two bushels of cleaned seed. That should be cleaned thoroughly, and the small light seeds taken out by a stiff fanning and sieving. These two bushels (more or less) of selected seed should be sown on a plot of well prepared fertile land. The crop from that will furnish seed for the general crop of the farm of that class of grain. It is important that that plot should be in the best possible condition for crop growing. The productive qualities of those selected seeds are improved by being grown on land which bears large crops. Before the crop from the seed grain plot is harvested, a selection of the heads from the most productive and vigorous plants should again be made. These furnish the seed for the seed grain plot the succeeding year. The seed grain plot itself should be one on which a well manured root or green crop or a clover crop was grown the previous year. In a few years a farmer could grade up the strain of seed on his farm to yield from 10 to 20 per cent more per acre. Even if he does not follow that systematic selection, if he sows only heavy, plump seeds, *from the largest yielding crop he can find in his locality*, he will derive very great benefit.'

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Now I verily believe that, not only from my reading but from my observation and experience. I also believe in the wholesomeness of putting into practice the faith that is in me. That summer—1899—I put aside $100—my own money, not the public funds—to offer in prizes to Canadian boys and girls who would send me the largest heads from the biggest plants of wheat and oats from their fathers' farms, partly to feel the way whether the country could be got ready to accept and adopt the principles and practice and partly to interest and educate the boys and girls. I had a wonderful response, and I paid that money in prizes with as much enjoyment as any money I ever spent. The letters I got from farmers and from their boys and girls were so suggestive and encouraging that in the following winter I went to my friend Sir William C. Macdonald and said: 'Here is a great chance to do some educational work in progressive agriculture; education not by reading alone but by having something interesting to do, something attractive, something definite, something beneficial to the whole community, something easy and yet with plenty of difficulties. A man may fail to appreciate the educational advantages set out in a written statement, but here is something for the boys and girls which the farmer can see for himself to be beneficial and which would be so helpful and instructive to boys and girls that they would go on with it; and the habits of observation and thought and study would go on with them.' He asked me what I would like, and I told him I would like him to give me $10,000 for prizes—the price of two farms—to set and keep this thing going for three years. I got the money with all good will—my little $100 came back a hundredfold—to offer as prizes to boys and girls to encourage them to observe and study this matter of getting the largest heads of the most vigorous plants and growing seed from those heads by itself. The agents who become instruments of progress in farming and other affairs are men and women or boys and girls, knowledge and wealth. In this we had the wealth from Sir William C. Macdonald, I happened to have the knowledge at first and the boys and girls did the work under the incentive of the prizes. The effort has resulted in the most satisfactory progress all over Canada, from the Atlantic seaboard to the other coast. There was a yearly competition in and for every province; and also a main competition extending over three years; every boy or girl living on a Canadian farm who was under 18 years of age on January 1, 1900, could enter as a competitor. I offered ten prizes in every province for oats and ten for wheat, the prizes in the yearly competitions ranging from $25 for the first, down to $5 for the tenth. The boys or girls who sent me one hundred of the largest heads of wheat or oats from a crop grown on their father's farm received prizes to the number I have stated. One condition was that each competitor selected by hand out of the same crop enough similar heads to plant a quarter of an acre the following year. The purpose was not to get the largest heads sent in, but to induce the children to plant a quarter of an acre with grain from large heads. The next year they would have an object lesson, they and their fathers, as to the value of such seeding. That was done during three years, and 485 prizes were paid, to the amount of $5,417, on the yearly competitions. A boy could not be expected to work and wait three years for his first chance of a prize, and therefore, we had to have that 100 largest heads competition annually to keep the boys and girls. The main competition consisted in sowing a quarter of an acre every year with seed from the largest heads selected from the most vigorous plants of the previous year's plot; and the main competition was based on the yields from those.

By Mr. Ross (Ontario):

Q. That is, in the second year the seed was selected from the biggest heads from this special or stock plot?

A. Yes.

By Mr. Robinson (Elgin):

Q. Did you have Indian corn too?

A. No, only oats and wheat. Then they had to select from the plants bearing the most vigorous heads 35 pounds of oat heads and 50 pounds of wheat heads. That

crop was produced from seed selected from the plot grown from the seed from big heads of the previous year. We are trying to establish a system whereby that practice, or the application of the principles underlying it, will be kept up, so that it can never be lost out of the farming of Canada. You see what a splendid vista of progress and promise and profit that opens up. In that main competition we have paid altogether 174 prizes, amounting to a total of $5,425, so that altogether we have paid $10,842 in prizes. The $10,000 which Sir William C. Macdonald put into the bank, with the interest, has brought me out square, plus a great deal of valuable information, plus much happiness in administering the work.

By Mr. Ross (Ontario):

Q. I suppose you will give us the result of your experiment?

A. Yes; but the results reached are not easy to define. Only 450 competitors went through with the competition; that is, only that number had selected seed for the quarter-acre seed plots up to and including the third year. About 800 started in, but all of them did not continue to the end. It was necessary that teachers or parents should supervise the measurements and weighings and send us certificates as to the work. I also got our dairy instructors, institute lecturers and travelling inspectors to help in the work by visiting these children wherever it was practicable and convenient. In addition I wrote the competitors three or four letters a year, asking them for information and encouraging them. That has brought about a fine relationship between these young people and our department. Some of them are getting their fathers to send them to an agricultural college, others are staying longer at school.

Regarding the crops which were grown in 1902 from the selected seed, 92 per cent of the reports said on behalf of parents and guardians that the quarter-acre plots carried crops decidedly more vigorous and heavy than the crops from the same varieties of grain grown on the same farm in the same season from unselected seed. That was the report of 92 per cent of the parents or guardians.

Let me restate some features of the competition to make them clear. The competitor was required to pick by hand the largest heads from the most vigorous and productive plants, in sufficient quantity to obtain seed from those heads to sow a quarter of an acre, which became the stock seed grain plot. Before the crop of the quarter of an acre was harvested, the competitor again selected by hand the largest heads from the most vigorous plants, in sufficient quantity to sow the quarter of an acre, which became the stock seed grain plot for the following year. Out of the large heads selected every year the competitors sent to me at Ottawa one hundred of the largest. A careful record was kept of the number of grains per hundred heads, and also the weight of grains per hundred heads. These boys and girls were not biased in favour of any theory, but the records of their work show that there was a remarkable increase in three years in the number of grains per hundred heads, and also in the weight of the grains per hundred heads. The percentage of increase from the crop of 1900 to that from the crop of 1903, on the average for all Canada, was 18 per cent of increase in the number of grains per hundred heads of spring wheat, and 28 per cent of increase in the weight of grains per hundred heads. In oats the figures were 19 per cent of increase in the number of grains per hundred heads, and 27 per cent of increase in the weight of grains per hundred heads. That is a record from several hundred seed grain plots operated by boys and girls. The plots and farms where these seed grain plots were carried on, were visited in many cases, and it was learned that the operators themselves, and neighbouring farmers, said that the crops grown on these plots from selected seed were heavier and better, and that the plants were more vigorous than those produced on the other parts of the farm from the ordinary seed of the same variety without systematic selection. When results so notable as those can be gained by three years of intelligent labour, what do you think is possible in thirty years, when this practice becomes the common one for grain growing on the farms throughout Canada?

I do not say that these results—these increases—were altogether due to improvement of the seed by selection. There is the acquired skill of the boys and girls in picking the best heads, due to trained observation. There is the better cultivation of plots to be noted. When these and other contributing factors are all allowed for, there is still much of the improvement to be attributed directly to the systematic selection. The general testimony to the superiority of the quarter-acre seed plots is confirmatory of that.

By Mr. Robinson (Elgin):

Q. Did all the provinces take part in that competition?

A. They all took part, and nearly in proportion to their agricultural population.

By Mr. Cochrane:

Q. Is it not a fact that the same seeds grown continually under similar conditions will deteriorate?

A. Some farmers have been doing this kind of thing, applying a principle of selection in a rough way, for many years; as they have done in Scotland for thirty years to my own knowledge with advantage. I do not know of any case in which the seed has run out or deteriorated if annual selections have been made of the best seed or even of seed from the best part of the crop.

Q. I have found that it is a good thing to change seed in a locality sometimes.

A. That may be in some instances; but I do not know of a single case where the seed has run out during systematic selection. In Fifeshire, where they grow heavy crops, it is a common practice there for the farmers to pick out an acre or more on their fields where the heaviest and best crop grows, save that, and stack it by itself, for seed.

Q. Do you think it has a beneficial effect to have the heads selected only while growing?

A. If the head of seed came from a weak plant, even although it was a large head, it would not have the inheritance of vigorous productive qualities. It is not merely the long, large head or ear that is wanted, but the large head full of plump, well ripened seeds from the large vigorous plant that is wanted.

By Mr. Wright:

Q. We have been handling pease, as you know, for many years and we have found it to be a certainty in the case of farmers with light soil, that their pease grown on that light soil deteriorate and in three or four years become extinct, while farmers that have clay land can grow pease year after year and they do not appear to deteriorate at all.

A. Perhaps you will find that the bacteria that nourished the pea plant is much more abundant in lime and clay soil than in sandy soil. With regard to the effect of the nourishment of the crop on the quality of the seed from it, I remember going across the great wheat field at Rothamsted, England, with Sir John B. Lawes, who I think was the greatest authority on crop growing that the world has known so far. He had grown wheat on that field for something like forty-eight years under constant, continuous and regular supervision. I suppose there were perhaps twenty-five or thirty plots in that field, each plot would be twice as wide as this room, and then there was a passage between the plots; each plot was drained, and drained into a cemented trench at the far end; the drainage had been collected and analysed for many years, so that they knew exactly what came out of the field both in the crop and in the drainage. On the plots of the field different fertilizers had been used. On the first plot barn yard manure had been applied every year, the average crop being over 36 bushels to the acre. On the next plot commercial fertilizers had been used and it had given about the same yield per acre. The next plot had got absolutely nothing for over forty years; it had received nothing at all in the way of manure or fertilizer; and gave a crop on an

average in recent years of about 13 bushels per acre: as Sir John said to me, 'the average crop of the United States with her virgin soil.' There was a field that had been in wheat for over forty years, but not with the same variety of wheat always. Sir John said he was sorry he had missed one point in his investigations. I put this question to him: 'You sow the same variety all over the field; here is a plot that will give you 36 bushels per acre and here is another plot that will give you 13 bushels per acre. Have you tried sowing seed obtained from a badly nourished crop side by side under the same conditions with seed from the well nourished crop?' He said he had not tried that. Then I inquired what difference he thought there would be. He said he thought that the influence of that heavy crop—36 bushels per acre—would be felt for three crops afterwards as compared with seed obtained from the 13 bushel plot. Now that is the opinion of a man—the opinion of, I think, the wisest man I ever met on agriculture—to the effect that for three successive crops you would find advantage from using seed from a well nourished crop. Every quarter-acre seed plot can be specially well cultivated; and then you can get the seed from the larger and more vigorous plants; thus you get not only the reinforcement of vigour by the selection of the large heads, but also get the seed from extra strong plants for general use on the farm.

ORGANIZATION OF A SEED GROWERS' ASSOCIATION.

I would like to state what we propose to do and what we have already done in connection with this Macdonald seed grain competition. We have about 450 farmers or farmers' children in Canada who have each on hand now, enough seed for about a quarter of an acre, obtained by this special selection for three years. A number of them have been organized into a seed growers' association; and provision has been made to take in everybody who wants to come in on the same terms. Provision will be made for registering seed selected in that way, and having it sold under registration numbers for seed purposes as distinguished from seed grown for food or milling purposes.

I think the best course I can follow perhaps is to read to the Committee this announcement of the Macdonald-Robertson Seed Growers' Association, which sets out very briefly and clearly the objects and methods of the association.

By Mr. Ross (Ontario):

Q. How many varieties of wheat were sown by these 450 farmers?

A. I do not know, but they sowed the common variety grown in the neighbourhood; we made no restrictions about that.

The announcement of the Macdonald-Robertson Seed Growers' Association is as follows:—

With a view to encouraging further the production and general use of seed of superior quality for farm crops, the Honourable the Minister of Agriculture for Canada has authorized me to announce that the Department of Agriculture will grant such assistance as may be necessary to enable an association or associations of producers of improved and registered seed to carry on effective work.

In all kinds of farm crops the yield per acre may be materially increased and the quality substantially improved by the use of seed which has been graded up by careful growing and systematic, intelligent selection, continued without interruption from year to year.

The qualities known as vigour of growth and productiveness in individual plants, are transmitted through their seeds to the succeeding crops quite as surely as any desirable characteristics are transmitted to animals from their ancestors.

All seed for general use should be obtained from varieties of which the quality has a relatively good market value, from crops which have attained a high degree of productiveness, and from localities where the climatic conditions are not much different from those where the seed is to be used.

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All farms and all kinds and conditions of soils are not well adapted for the production of seed of superior quality, of all kinds of crops. Grain, and other seeds, for seed purposes, should be produced on lands that are free from noxious weeds and capable of producing those crops at their best in quality and in yield per plant.

There is a need and opportunity in every agricultural locality in Canada for a few farmers to make a specialty of growing high-class seed in quantity for the purposes of seed as distinguished from grain for feed or food. There would be immediate profit to all growers who managed that special branch of farming with care and intelligence. Other farmers would seek from them the supplies of seed for their general farm crops.

The best results for all concerned are to be obtained from organized effort, under intelligent direction. Associations of farmers making a specialty of growing grain and other crops for seed purposes on well kept and highly conditioned farms, should be organized as a means of improving their seed and of educating buyers and farmers generally on the value of pure-bred registered seed.

I. Some four hundred and fifty of the parents of competitors who have been operating plots in the Macdonald seed grain competition have expressed their intention of continuing the work of producing pure-bred seed by hand selection. They with others who may join us, will become the original members of the Macdonald-Robertson Seed Growers' Association for the Dominion of Canada.

I desire that seed growers who have given special attention to the production of wheat, oats, barley, rye and corn during the past few years should also become operating members of this association and make provision for operating a seed plot.

II. The object of the association will be to advance the interests of seed growers,—

(1.) By forming regulations as to methods;

(2.) By publishing information as to standards;

(3.) By issuing certificates of registration which will distinguish between hand selected pure-bred seed and ordinary grain; and

(4.) By such other means as may become expedient from time to time.

Provisional directors of the association are to be called together at some future time to consider and revise the rules and regulations which have been drafted for the guidance of those who operate seed plots in 1903. Arrangements may also be made for the formation of district and local associations in the various provinces.

III. The Macdonald-Robertson Seed Growers' Association for the Dominion shall consist of honorary and operating members.

(2.) Persons who may be engaged in agricultural research work, or who may be otherwise interested in the progress of agriculture, may be admitted as honorary members. When appointed or elected as honorary members of the association, they will be eligible to any office, and enjoy the same rights and powers as operating members.

(3.) To be eligible as an operating member the applicant must be a producer of improved seed, and must each year conduct a hand-selected seed plot, consisting of not less than one quarter acre of land.

IV. By the term 'hand-selected seed plot of the first year,' is meant a piece of land bearing a crop produced direct from seed obtained by selection, by hand, of the heads or ears from plants appearing relatively large and vigorous for the variety.

(2.) By the term 'hand-selected seed plot of the second year,' is meant a piece of land bearing a crop produced direct from seed obtained by selection, of the heads or ears from plants appearing large and vigorous for the variety on a hand selected seed plot of the first year.

(3.) By the term 'hand-selected seed plot of the third year,' is meant a piece of land bearing a crop produced direct from seed obtained by selection, by hand, of the heads or ears from plants appearing relatively large and vigorous for the variety on a hand-selected seed plot of the second year.

V. It is permissible to select heads in sufficient quantity to sow a hand selected seed plot or plots of a total area not greater than four times the size of the plot from which they were selected.

VI. To entitle the seeds of wheat, oats, barley or rye to be eligible for registration by the Macdonald-Robertson Seed Growers' Association, they must be produced on a well cultivated registered seed plot from a crop that has followed in rotation,—

(1.) After clover, pease, beans, or some other leguminous crop; or

(2.) After a cultivated crop, such as Indian corn, turnips, mangels, carrots, beets or potatoes; or

(3.) After a summer fallow.

VII. There will be three distinct classes of registration for seeds.

(2.) In the pure-bred class there will be registered as 'pure-bred registered seed' only seed obtained from heads selected by hand from the plants relatively the largest and most vigorous on a registered hand selected seed plot of at least the third year. The registration certificate of 'pure-bred registered seed will show the number of years of antecedent selection, as for instance 'pure-bred registered seed of the fourth year' or of the tenth year, as the case may be. Such seed will be suitable for use on hand-selected seed plots to produce 'improved registered seed.'

(3.) In the improved class there will be registered as 'improved registered seed' only grain obtained from a crop produced from pure-bred registered seed. The registration certificate of improved registered seed will show the number of years of antecedent selection of the crop from which it was obtained, as for instance 'improved registered seed from a crop of the third year,' or of the tenth year, as the case may be. Such seed will be suitable for use on improved seed plots to produce 'general crop registered seed.'

(4.) In the general crop class there will be registered as 'general crop registered seed' only seed obtained from a crop produced from improved registered seed. Such seed will be suitable for use for the general crop of the farm, and the product from it will not be eligible for registration.

The diagram at the end of this announcement will help to make clear the system of selection and registration.

VIII. Records will be kept on which will be entered,—

(1.) The names and addresses of the members of the association or associations;

(2.) The size of the hand selected seed plot of each operating member;

(3.) The size of the improved seed plot of each operating member;

(4.) The yield per acre of each registered plot; and

(5.) The disposal of the seed from each registered plot where certificates of registration are issued.

IX. The Commissioner of Agriculture and Dairying will in the meantime control the issuing of all certificates of registration of seed plots and seed, and take such steps by way of inspection, supervision of the operation of seed plots, and otherwise, as

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shall safeguard the certificates from being used fraudulently or in any manner contrary to the regulations or to the interests of the members of the association or those engaged in the production of pure-bred registered seed.

X. In the production of registered seed it is recommended that the hand-selected seed plots and the improved seed plots be sown much thinner than has been the common practice in the locality. The thin sowing will to a great extent give individual plants an opportunity to stool or tiller. The aim should be to obtain a maximum of vigour and of yield per plant rather than a maximum of bushels per acre on the seed plots.

XI. Where a grain drill is used for the hand-selected seed plot, it is recommended that at least one tube in every four be plugged or stopped up. That will leave space between every three rows of grain convenient for the operator to pass along to gather the large heads from the most vigorous plants. There will be also some other advantages from that practice.

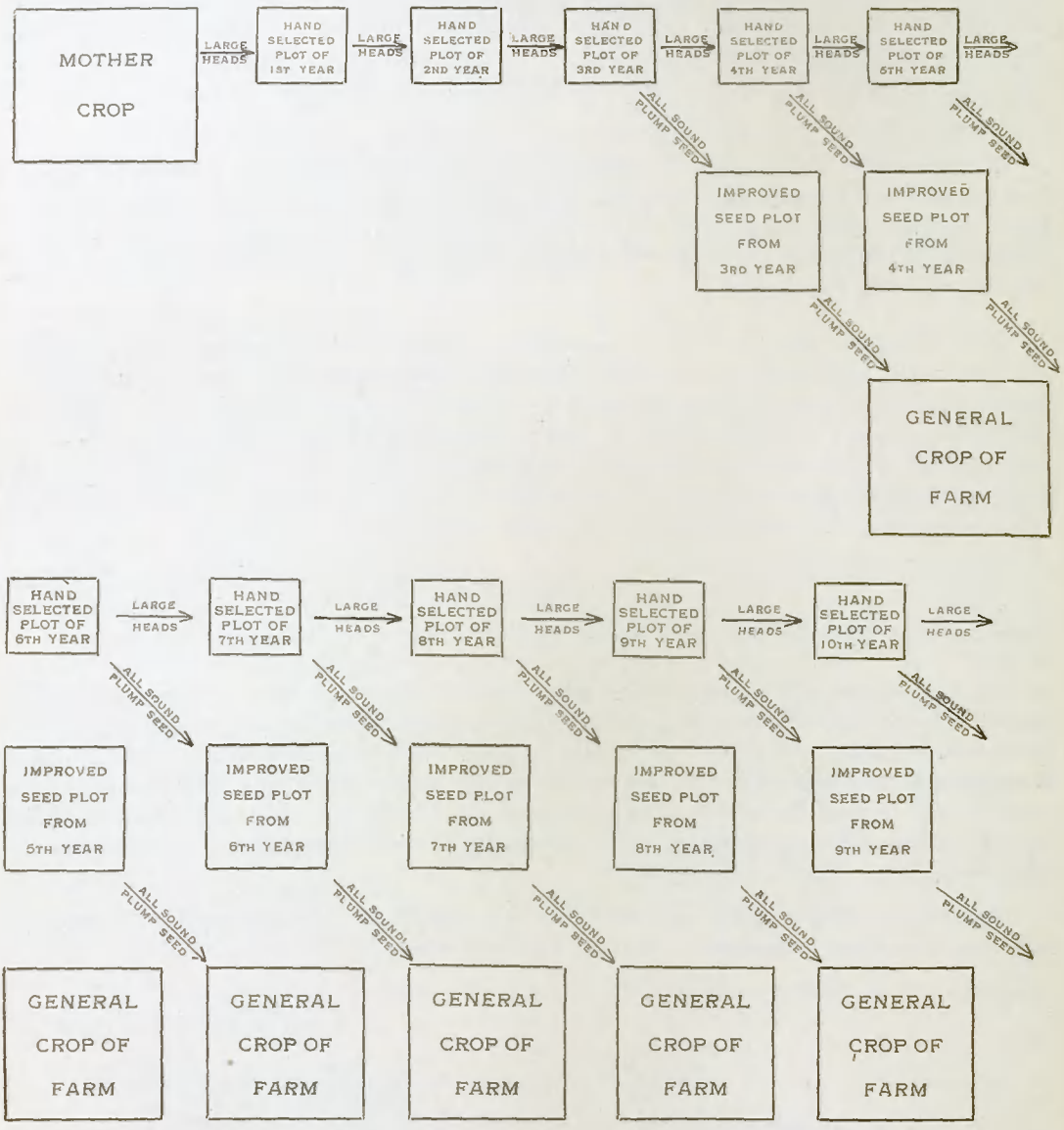
XII. Farmers who are not in possession of seed from a hand-selected seed plot and who wish to join the association as operating members for 1903, should secure good, sound, plump seed of a variety of good market quality, known to be suitable to the locality, and, if possible, from a crop which gave a heavy yield. From the crop produced from such seed, on a specially prepared plot sown thin as recommended, the heads from the largest and most vigorous plants would be selected by hand this season for the hand selected seed plot of the first year, to be grown in 1904.

XIII. The members of the Macdonald-Robertson Seed Growers' Association are not required to pay any fees, or to undertake any obligations to contribute to the expenses necessary for managing the work connected with the organization.

XIV. It is desirable that the membership of the association be not too large at first. It is to be borne in mind that at the present time most farmers do not appreciate the value of selected seeds; and as seed grain improved by a system of hand selection cannot be produced at the same cost as grain grown and sold for food purposes, it will be prudent to push the growth of the association only in keeping with the growth of demand for registered seed. However, a limited number of operating members from every county is desired.

Applications for membership should be addressed to the Commissioner of Agriculture and Dairying, Department of Agriculture, Ottawa.

CHART TO SHOW METHOD OF SELECTION.



JAS. W. ROBERTSON.

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Cut off at this line. In a closed envelope it will be carried free by mail.

Dated.....190...

at.....

To JAS. W. ROBERTSON,
Commissioner of Agriculture and Dairying,
Ottawa, Ont.

SIR,—I hereby apply for membership in the Macdonald-Robertson Seed Growers' Association. I intend to operate a seed plot or plots in accordance with the rules and regulations of said Association.

Please write clearly. } Name.....

Post office.....

.....

The farm on which the seed plot will be is,—

Lot.....

Township of.....

County of.....

Province of.....

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By Mr. Ross (Ontario):

Q. Is Sir William Macdonald still going to continue the giving of prizes?

A. They were given only for three years, but Sir William has said that if the government is not willing to stand behind the seed growers' association with enough money to make the thing national he will be glad to do it. I have said it is a question that so concerns the nation that I have asked the Minister to put in the estimates a sum sufficient to do this on behalf of the government. It is intended then to let the Macdonald-Robertson Association become the Dominion of Canada Seed Growers' Association. We expect to have a Bill, perhaps this session, to make these associations subject to the control of the department as the live stock associations are.

Q. Quite right!

By Mr. Thomson (Grey):

Q. Are these associations distributed throughout the provinces?

A. The members of the one association are distributed pretty well throughout all the provinces; the places where we had the largest percentage were in the French part of Quebec and in Prince Edward Island. We expect provincial and district associations will be formed.

By Mr. McGowan:

Q. I should think there would be no need to give prizes.

A. No, there is no need to give prizes, but it would seem desirable, after these associations are started in each county or group of counties perhaps, that the man who keeps his plot best, has it cleanest and has the best yield, should obtain some recognition, a prize perhaps like those at agricultural exhibitions.

By Mr. Erb:

Q. You recommend selecting the very largest heads of wheat; but when selecting sugar beets you advise choosing the medium sized root. What is the difference?

A. The difference is this, that a large head of wheat contains more grains of wheat, of as good quality, than a small head, whereas a very large beet contains a smaller percentage of sugar than a medium sized one. The sugar grower desires to get the largest quantity of sugar per acre and finds that in a crop of roots of medium size. We find in grain the larger the plant the better. In many instances in the competition we found the number of bushels per acre almost double the number of grains per head.

Q. Is it found that the larger beets do not contain such a large percentage of sugar as the medium sized?

A. That is the rule, I believe, to pick out the medium sized for mothers.

By Mr. Robinson (Elgin):

Q. Is that found to be the rule, twice the number of bushels per acre that there are grains per head?

A. That appeared to be indicated by the observations that have been made in the Macdonald competition.

Some beets have the habit of growing out of the soil more than others, and the growers discard that kind of beet because the part above ground contains less sugar and——

Q. What did you say about the part above the ground?

A. It is found to be largely mixed with impurities difficult to separate from the sugar.

By Mr. Erb:

Q. But they select large beets after testing.

A. They select medium, smooth beets first and from these rows they take the larger on the average if they are smooth.

By Mr. Robinson (Elgin):

Q. They don't test the whole of the beet but only a small portion of it.

A. They take out a little core and so leave the beet in a condition to grow when it is planted.

Mr. WRIGHT.—Mr. Chairman, the professor has given us a very good idea in one respect as to what Sir William C. Macdonald is doing for the cause of education in general, and particularly with reference to farming. Now we have not too many men like Sir William C. Macdonald, and perhaps there are only three other men who stand out pre-eminently in this country as those who have assisted the cause of education—McGill, McMaster and Lord Strathcona. Now I would like to have Professor Robertson give us some idea some other day as to the other work he is doing with the assistance of Sir William C. Macdonald in the matter of education as it bears on the cause of agriculture. You know a large work has been done and is likely to be successful in a large number of public schools for the carrying on of manual training, and I would like to know if he could give us some information about it. It is hardly under the Agriculture Department, but he might be able to give us some information which I think will be valuable to the Committee and the country.

Professor ROBERTSON.—If the Committee likes I will be very willing to come before them in that way. I have the authority of the Minister, I had the authority of the government some years ago, to take what time was necessary to administer the Macdonald Manual Training Fund to establish manual training in Canadian schools. I did not do that as Commissioner of Agriculture, but as James W. Robertson, of Canada. We have manual training established and maintained by the Macdonald fund in twenty-one towns. The local authorities in many other places are this year supporting the classes themselves. There are forty-six manual training teachers on the pay roll, from British Columbia to Charlottetown, whom I pay monthly. Sir William C. Macdonald has further given me a large sum of money to use in the improvement of rural schools and in the giving of object lessons of school gardens and instruction in domestic subjects.

Mr. Ross (Ontario).—That is nature studies ?

Professor ROBERTSON.—Nature studies, household economy and manual training, having the children trained to exercise their intelligence on the things they see about them. I am a citizen of Canada and I have the consent of the Minister of Agriculture to use what time I need, even in office hours—my leisure time is my own—in order to carry on this most valuable work which Sir William's wisdom, good-will and generosity have made possible. It is rather a big scheme. I gave an address recently in Halifax, N.S., and the legislature accepted the policy as a whole. They are going to establish a college of agriculture at Truro and have a Bill before the House, voting $36,000 to assist in the consolidation of rural schools. I am to go before the legislature of New Brunswick next week. While education is a provincial matter, I am not interfering with provincial rights, but am co-operating with the provincial authorities to bring about improvements which they also desire.

Mr. ROBINSON (Elgin.)—What does this manual training consist of?

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Prof. ROBERTSON.—A room is set apart in any school where it is adopted; it is equipped with benches and tools; and the boys give an hour and a half or two hours a week to practical work there under instructors, making drawings and making articles in wood.

Mr. ROBINSON (Elgin).—I think we should get that information before us.

Having examined the preceding transcript of my evidence of April 15, I find it correct.

JAS. W. ROBERTSON,
Commissioner of Agriculture and Dairying.

THE MACDONALD FUNDS FOR MANUAL TRAINING AND THE IMPROVEMENT OF RURAL SCHOOLS

COMMITTEE ROOM 62,

HOUSE OF COMMONS,

FRIDAY, May 1, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day at 10 o'clock, a.m., Mr. Douglas, Chairman, presiding.

Prof. J. W. Robertson was present by special request of the Committee and made the following statement in regard to the work being done under the Macdonald schemes for the improvement of rural schools by means of consolidation and otherwise:—

MR. CHARMAN AND GENTLEMEN,—I have been asked to come before the Committee this morning mainly to give some information on what has been done and is being done by the funds provided by Sir William C. Macdonald, of Montreal, for the improvement of education bearing upon agriculture. While I am still Commissioner of Agriculture, I am speaking this morning as a private citizen of Canada, administering private funds for the good of a great branch of the nation's interests. I have the happiness of working in the fullest harmony and co-operation with the department of education of every province, so I am not in any sense interfering with provincial rights or trespassing on the administration of educational matters by provincial authorities. Moreover, I have received permission from the Minister of Agriculture, acting for the Dominion Government, to carry on this work. In so far as the matter is connected with schools and education at schools, no public funds of the Dominion are used; the funds provided by Sir William C. Macdonald cover all the expenditures I make in that connection.

In my capacity as Commissioner of Agriculture I have had opportunities of seeing what is being done in other countries by government authorities for the improvement of agriculture through education; and I have used these opportunities and the information obtained from them for the benefit of all the provinces of Canada alike. As far as we have gone at present, the funds which Sir William C. Macdonald has put at my disposal have been available to and expended in all the provinces, from British Columbia to Prince Edward Island. It might be permissible and desirable to say more than a few words before this Committee to show what a large bearing the education given in rural schools has on the progress of agriculture and the prosperity of the Dominion. If I might cite one paragraph to the Committee, I would quote a very short one from the report of the Commissioners appointed by the Imperial Government to consider the improvement of schools in Ireland, and to report on the subject of manual and practical instruction in the primary schools under the Board of National Education in Ireland. The report was published in 1898. I got very much help from this report and I have used its recommendations largely; so you see I am not going about this business in an amateurish fashion. The Commissioners in their final report say: 'The progress of the people in wealth and material prosperity must largely depend on the education given in the primary school, and to make that education thoroughly efficient and fit for its purpose is a task, we submit, which may well be undertaken in the highest interests of the state, whatever the necessary cost may be.'

Essentially the progress of the people in wealth and material prosperity depends on the quality of education in the primary schools. We in Canada enjoy very much prosperity and have made great progress. Much of that has arisen out of the quality

of our education and of the particular application of special means for agricultural education in various fields and in various forms. I need only mention in passing that the bountiful harvests, absence of serious pestilence, and the enjoyment of peace have given us good times in a wonderful degree; but we are making progress also by organization of the forces that make for the improvement of agriculture. I need not say further before this Committee that while wealth might come to a nation rapidly for a short time, real progress and stability in national life keep side by side with the progress in education. One discovery may make a nation rich at once, but the application of intelligent labour is the only sure way to make real progress; and that depends on education.

I say as an official as well as a citizen, that while we have institutions of self-government, of which this Committee is a splendid part and illustration, the meaning and merits of these things depend on the intelligence and ability and good-will of the common people; and that this intelligence, ability and good-will are fruits of the schoolhouse. How can a people love and maintain liberty unless they love knowledge and promote intelligence? How can a people who prize intelligence diffuse it among the ordinary citizens of the nation unless they have an organized system reaching from the universities into the common elementary schools? And how can a people cherish and administer justice, pure and undefiled, unless they have an intelligent understanding of the principles of fair play, with courage enough to give them effect? A great citizen of Canada with his wealth is doing much to help the nation forward and upward; and through me has chosen to identify part of that work with the Department of Agriculture of the Dominion, and also with the departments of education of all the provinces in Canada.

THE RELATION OF GOVERNMENTS.

There is no spectacular politics in helping the common rural schools. There is no theatricals in getting down to fundamental principles and means to help the boys and girls in the country who are little heard of, but who need the action of the governments and of the legislatures to enjoy a fair chance. There is constructive statesmanship in such a policy. It is not the work of building with wood, hay and stubble; it is building with gold, silver and precious stones; it is building up fine character in human lives; it is work that is worth doing well. The government is the intelligence of the people organized for their protection against outside enemies, and against inside foes like ignorance, disease and crime. That is what responsible governments are supposed to exist for ; and a pressing duty is to take hold of this problem of education for the benefit of the rural communities, and organize it. It deals with two things that concern the progress and the safety of the people. First, with the personality, with the personal power, of the individual citizen, and, second, with his chance in life. Personal power is added to only by education. That is the only means of improving what the Almighty gave any one in natural endowment. The ordinary child needs that as much as the child of rare mental powers; nay, perhaps needs it more.

Then I take it that governments are to some extent concerned with the individuality and also the opportunity of the governed. What is meant by opportunity? The right of individuals to liberty and to hold property; facilities for safe communication—for travel and transportation of goods; security of opportunity for earning a living and obtaining a fair share of happiness and possessions. These are in rough comprised in opportunity as controlled by governments. The post office, the railways, the common roads, the bridges, are fundamental to equity in opportunity and need not be discussed here. I want your attention on the subject of the personal power, the ability of the child. It is always with us and always needing improvement, enlargement, nourishment, by education. It needs it on the farm as much as, or more than, in cities, where men most do congregate.

I have spoken of personal power being gained by education. That may be augmented in the case of any individual by the control of wealth and other forces. In that sense the great resources that we have in Canada reinforce and increase the

national power, which is the aggregate of the power of the individuals. And believe me, the quality and effectiveness of that power may be added to in geometric ratio by the quality and ability of leaders. No nation has ever attained greatness in any direction that had not its own leaders. Every people will follow leaders born into sympathy with their aspirations and trained into ability to meet the new conditions of every new advancement. Let our leaders for the new conditions in agriculture, for the new needs in education, be trained in our own colleges of agriculture, properly fitted into systems which include the rural schools, and they will mightily help the rural communities.

CHARACTERISTICS OF THE UNEDUCATED.

Will you join me for a moment in considering the characteristics of the entirely uneducated person? That is, not the man who cannot speak good English, because many men who are highly educated do not speak it at all. By the uneducated person I mean the person who is ignorant, the person who is helpless, the person who is selfish. I do not care which of these three is taken, they are severally and collectively the stamp of the uneducated. As there is progress out of ignorance into enlightenment, out of helplessness into personal ability, out of selfishness into public spirit, there is so much substantial gain. I think the schools should concern themselves with helping the child to think clearly, to observe clearly, to investigate carefully, to understand fully, and to manage economically. Why should a child in school be deprived of the privilege of studying nature when he lives by natural processes and the whole human race is sustained by them? Before schools were invented that was the way by which the race made progress. The school came in to supplement the unorganized study of nature and manual training; but by and by it came near depriving the child of what was really essential to him, by absorbing the whole of his time with formal studies from books. Manual training is an essential part of good elementary education. Who are the masters of the earth to-day? Who became the first masters of the earth? Put man on the same level with the wild beast with the longer tooth and stronger claw, and man is soon nowhere; but let him take a club, a weapon, a tool, and he is master. With fire in the one hand and a weapon or tool in the other, the mastery is asserted and maintained. Man became the tool user ; then the user of instruments ; and the masters of the globe to-day are those who can best use weapons, tools, machines and instruments. For what is the modern struggle for markets—for the 'open door?' Is it not to give security of employment to the myriads of workmen who use tools and run machines? Of course the commerce which has grown from ability with tools, machines, and instruments, in factories, on farms, and in shops of all sorts, is not the best thing we have even in this period of great trade expansion. Far from it; so let us see that the ability for work and the capacity for happiness are alike conserved and developed by the schools. In our zeal for teaching the 3 R's, and a whole lot of other things, the training towards and into ability to do things with the hands has been left out of the schoolhouse. For that reason I have sometimes been disposed to feel pleased rather than sorry when I heard that a boy had gone fishing instead of sitting passively on a bench at school. You may reform a boy's manners after he grows up, but it is doubtful whether you can in a similar superficial way reform the structure of his bones or the texture of his nerves and brain. Perhaps the quality of the bones depends upon his getting wholesome milk until he is three years old, and the development of his brain upon his being trained to use his hands and eyes and senses before he is fourteen.

ON THE MEANING OF EDUCATION.

Let the boy be trained by the processes of his schooling to think clearly towards a definite end, believed by himself to be useful and beautiful. Let him be trained into expression of his thought, not only in words, but in deeds, and in things. These will help to form and bring out habits of carefulness and of accuracy—that fine passion for truth—and of self-reliance. These lead a man to seek mastery, not for selfishness, but for the service of his fellows and of truth.

Education is not obtained from books, except in a small measure; it is a series of experiences. That brings me to speak, if I may for a moment, on the term education itself. One would hardly accomplish much if he were talking about schools and education with one meaning in his mind, while the people to whom he was speaking had another in their minds. I have known two men quarrel most furiously in an argument because one man was thinking of one situation, and the other of an entirely different situation. That is the way uneducated nations try to settle a difference of judgment. When we get sufficient education among the common people, nations also will adjust their differences by observation, investigation and mutual understandings.

In the schools we used to be told that education meant 'a leading out.' Therefore, if you lead the mind out, the boy has education. Take an elastic band: the more often I 'lead it out' the less use it becomes. There is no use in a leading out unless you lead the mind to do something when it is out. There is no use in leading a boy out to a perception of ideas unless he does something with the ideas in time to make perception part of the process of education toward ability. That is how education is gained and progress made—by putting every new idea to the proof—to the limit of its power to serve and nourish—by doing something with it. Education is a series of experiences. If a man gets the sort of education that means being led out for show at examinations, he may get more of the same sort in real life. A friend of mine, a very candid clergyman, had been led out to some congregation east of Toronto with a view to a call. Somehow he did not please them, and was returning home on the same train on which I travelled. He said to me, 'I feel just as I suppose a horse may feel at a horse sale, when he has been led out and the horse dealer has said: "That will do; just trot him back." I am being trotted back.' That is the judgment the great public will pass on every man's life who lets himself be led out for anything else than to do something useful with and by his ideas when they are out. That is the judgment the great Arbiter of all life will pass, 'Who will render to every man according to his deeds,' and not according to dreams and fine theories. If a man does nothing with his ideas except to recite them, he is not educated. So education is a series of experiences leading out to ability: ever increasing ability; ability to see, to understand, and then to do. Ability to see and ability to do—these two halves, seeing and doing, make education.

DOES EDUCATION PAY?

Some one asks, 'Does education pay?' That is a question put by the citizen who pays the taxes. What does pay? What is worth while? What is life itself and the world worth to anybody? Nothing, except as they provide for and make for richness of experiences. 'What shall it profit a man if he gain the whole world and lose his own soul?' You may stick everything he can desire around a man, and what would they be worth to him unless they helped to enrich his life, his experiences? If you put flowers around a blind man with no sense of smell, of what use or benefit would the flowers to be to him? However, the presence of a blind man does not abolish the beauty or fragrance of the flowers in your garden.

It is wise to take note of all the methods and means that have been successful. I think it is foolish for a man to say that he will start from the beginning without first doing that; such a man would proclaim himself a fool in any practical undertaking. The most that people of any generation can do is to improve a little on what their forefathers left them. We have made progress along several lines. Cannot these lines be broadened and lengthened; can new ones be joined to them, while still getting full service from what has been found useful in the past? There is need for more knowledge among people who farm, in regard to managing the natural forces in accordance with the laws that govern all plant life and that govern all animal growth.

Let me make an explanatory parenthesis here. There is a real difference between knowledge and ability. There is a wide difference between soil physics and practical tillage. Every man who understands soil physics can manage land and crops better than if he did not understand the principles. Knowledge will help every man to greater

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ability, but it does not in itself constitute or confer business ability. A man may know all about the composition of a soil and still be a poor farmer. Therefore, some one may say, 'Throw knowledge to the winds.' Not so. Every man does better in so far as he knows more and knows better; but a man may know much and not be able to apply it. There is a difference between scientific knowledge and the business application of it. Huxley once said he could not grow as big turnips as Hodge, but he could tell Hodge what would enable him to grow still bigger turnips and to make more money. The agents who become instruments of progress in farming and other affairs are Men, Knowledge and Wealth. With the efficiency of these as factors, and with the effectual use of them as means, education has nearly everything to do.

The use of faculties trained to the widest range of enjoyment, is what makes for the richest experiences in life. Education itself is a series of experiences leading up to personal intelligence, ability and unselfishness. It is not a remembrance of names, although sometimes memorized knowledge of a second-hand sort has been counted its object. It is a series of experiences from the doing of things, whereby ability is gained to enjoy things and to enjoy life. In every sense education does pay. It is the one thing that enriches the life of individuals and nations. As nations have ideas and ideals, so they live and lead, and thus are they powerful. What is China, with her six hundred millions of people? and she has had bookishness and examinations for centuries. On the other hand, Germany is training the hands as well as the heads of her boys. Her schools and universities are progressive, and the country is making great headway, not only in the arts and sciences, but in all that gives power to dominate in human affairs. Let us rather follow the modern German methods, and not be led any further in the Chinese way of doing things in our common schools.

Education always stands for some sort of power—power to see, power to know, to understand, to do, and therefore power to be. If we are now on similar lines of thinking regarding education, we are ready to consider in what further respects our agriculture may be developed by the application of education, such as is to be promoted by the Macdonald Rural Schools Fund.

China has more men and women than we, other peoples have more knowledge and greater learning than we enjoy, many countries have much larger wealth than we possess, but I do not know of any land in which these factors are more active towards progress than in Canada, any land in which men and women are using knowledge and wealth with more effect, with more success in helping on the weal of the nation.

AGRICULTURAL COLLEGES TO HELP RURAL SCHOOLS.

Any system of education which aims at or proposes to help the people who work on farms must be a system that will help the elementary rural schools; because those are the schools where the future men and women on the farms will get their formal education, during my life time anyway. I listen with interest to many speeches, and I hear men say, 'Why can we not have such education for the farmers as the doctors get; why can we not have a farmer's college?' Let us examine that proposition with regard to its meaning. A doctor does special work for the community. He is not an ordinary member of the community; but is doing work that concerns the permanence, the vitality, the security of life in the community. A few men only are allowed to have charge of that branch of work, and then only when they are properly prepared for it. Otherwise they would bungle things and we would have a calamity. A doctor needs special preparation for special work; and he can gain it only by devoting himself for a long period after having received a college training. The farmer needs special training for his special work, but where can he get it? The few men who are to be doctors have to be spared from other occupations until they are twenty-two or twenty-four years of age. They have to be spared for schools, colleges, hospitals, as otherwise they could not get the sort of education they require. But can the ordinary farm boy be spared from the farm until he is twenty-two or twenty-four years of age? If he could be spared, and I hope in course of time a larger number of them

may be spared, it would be of some advantage to him. But let us look at the other side. In Canada there are about one hundred and forty thousand young men in the rural districts of suitable age to go to college; that is, between the ages of sixteen and twenty. If all these boys were to get the same chance, we would need colleges capable of training over a hundred thousand boys. The fine agricultural college at Guelph, in the province of Ontario, seldom, if ever, had more than a hundred boys in the first year classes. If we undertook to provide a similar education for all the boys of that age from all the farms in Canada, we would need several hundred colleges as big as the one at Guelph. In this country of ours a certain number of young men are preparing to be doctors, and there are institutions enough that offer them all suitable courses of instruction. Every man who wants to be a doctor and has the natural ability, good health and perseverance, can get the education that will fit him to become one. Now, there are in this country, of a similar age with students of medicine, not fewer than a hundred thousand young men who are preparing to be farmers, and if they are all to get the same chance and training enjoyed by the students at the Ontario Agricultural College at Guelph, we would need hundreds of colleges to do the work. That is entirely impracticable; and in my opinion undesirable and unnecessary. The ordinary boy on the farm should have, as far as he can get it, the education that will fit him to become a good farmer. If he cannot have a chance of college life, if we cannot take him to college, we must take the knowledge and uplift of the college to him at and in the school to which he does go.

CHILDREN IN RURAL DISTRICTS.

From the census of 1901 I estimate that there are, in round figures, 746,000 children from five to fourteen years of age, in the rural districts, and 450,000 children of the same ages in incorporated villages, towns and cities. Multitudes of children in Canada have not the opportunities of a good education. That applies particularly to perhaps one-third of the 746,000 children who live in the rural districts. Educational leaders have been taken up with the education of children in the strong, rich communities. Courses in elementary and advanced schools in towns and cities are being adjusted to meet the commercial and industrial needs of children for the office, the store, the workshop and the professions. Courses in rural schools have not been adapted to the needs of the children in rural districts. Little attempt has been made to change or improve the course of study or the methods of training at country schools; and thousands of rural schools in Canada furnish their pupils with an exceedingly poor preparation for the duties of life.

The educational leaders have been concerned with the improvement of the schools in towns and cities in strong, rich communities, and with adjusting them to the needs of the urban population; but hardly any one has turned the power of a strong intellect and used voice or pen to the improvement of rural schools, which are now less efficient for the needs of the time than they were 25 years ago. The neglect of the rural schools has not been from the want of wealth, because Canada is increasing in wealth perhaps faster than any other country with a rural population. The fault has been the want of appreciation of the real worth and value of education in the community. That apathy leaves our rural schools in most cases in the hands of inexperienced young girls as teachers. A large proportion of the boys and girls to the number of 746,000 I have spoken of, are getting all the schooling they get under the care of a young girl teacher of nice temperament and nice manners, but without knowledge from experience or observation of the meaning of life in rural parts—knowledge that the boys and girls should have imparted to them.

The population of Canada is advanced enough in intelligence and civilization to recognize its responsibility for the present and future weal of those 746,000 children in rural districts ; and it is abundantly able, out of its accumulated and growing wealth, to provide all of them with a good elementary education.

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I do not discuss in the meantime the 344,000 young people between the ages of fifteen and ninteen years, living in the rural districts, who might receive systematic educational help after they have left attending school every day. Continuation classes on several evenings of the week, or opportunities for short courses during the winter months, when their labour is not necessary on the farms, would be a great boon to them and a fine investment for the country. Considered only in the light of the value of the labour of these young people, the cost of continuation classes in the evenings, and of short courses during the winters, would be made up tenfold to the community by their increased ability. More than all that, a new interest in life at home, a wider outlook with contentment, and the development of ambitions and aspirations to be useful, would be priceless assets to the good.

With all our getting and our growing, it behooves us to give the children of the country the best possible start in life towards making the most of themselves in the various walks of life amongst ourselves. It should be possible for every child born in Canada in this century to get a thoroughly good elementary education. If our civilization should confer that upon them as their birthright, it would be in every sense a blessing, greater by far than any inheritance of natural or developed resources belonging to the nation. The appalling waste of child-time in thousands of our rural schools is little less than a crime against humanity.

IMPROVEMENTS IN ORGANIZATION.

The public schools of Canada have played a great part in raising the general level of intelligence to a comparatively high plane. In our appreciation of that, we should not be led to conclude that they are doing all they could do, or all they should do, for the children in rural districts at the present time. The school systems and schools of the towns and cities of the Dominion, are unquestionably excellent as compared with those of other countries. The opportunities for education in rural districts in Canada are not more meagre than they are in some other parts of the world, but they are not worthy of Canadians at this time in their history and prosperity.

All schools to be vital with the people have to be continually adjusted and adapted to the new needs of new conditions of society. People want commercial courses now in the cities, they want typewriting courses, and shorthand courses and technical education everywhere. The word "technical" has a catchy quality, and unless discerning wisdom control it, it too, like the word "classical," may cover a multitude of shams. The schools in rural parts require to be adjusted to the needs of the rural people, so that these schools will have a bearing on the life interests, on the opportunities and occupations of the localities, and not be separated in subject matter and outlook from the home life and from the occupations whereby the parents earn their living. From the course of study and the subject matter in many schools in rural districts to-day, you would not suppose that the fathers of the children you see in them had any concern with or connection with soil, or crops, or animals.

It may be taken as a principle on which we are proceeding in the maintenance and development of systems of education in Canada, that all the resources of the country, as far as they are required, should be made available for the education of the children. Public education is now recognized as one of the functions of the state or nation. The property of the state—that is, of all the people of the nation—as a last resort, must be available for educating the youth of the state, as it would be, in the last resort, for the defence of the liberties of the state. Education in itself is the greatest defence and means of defence.

Expenditures for the maintenance of public schools in Canada are met by the provincial authorities, county authorities, township authorities and ratepayers of individual school districts or sections. The proportion borne by these different bodies varies in the different provinces. As a rule, the financial assistance from the central authority, either county or provincial, should be paid as an encouragement, and in proportion to what the people of the locality do for themselves as far as they are able.

WEAKNESS OF SMALL SCHOOL DISTRICTS.

The making of a unit large enough to include all the school districts in a township need not, in any sense, weaken, discourage or prevent local enterprise or liberality. A large unit for the maintenance of schools, like a township or even a county, makes for effectiveness, economy and equalization of burdens. The larger the unit the less unequal are the burdens on the poorer of the people. 'Ye also who are strong ought to bear the burdens of the weak, and so fulfil the law' of citizenship.

The smaller the unit of organization for taxing and for administration, the less adequate and efficient are the educational results. The smaller the unit, such as poor school districts with a small population, the less is the number of school days in the year, the less regular is the attendance of the children, and the fewer are the years they go to school.

There is a need for a better organization of the systems under which rural schools are established and maintained, as well as of the methods and the agencies in the schools: organization for scope, for economy and for efficiency. For scope, so as to be able to take in more and to do it better: for economy and especially for economy of child-time. Our most wasteful and unwarranted extravagance in Canada, without any exception, is the waste of child time in the common schools. The children come to school and do not apply themselves; and they get into that habit of doing nothing effectively; and so you find them inefficient when they are grown up, because of the habit of ineffective use of time, acquired in the schools and which becomes a menace to the national prosperity. You cannot have 25 or 40 children in a little school under one mistress trying to cover the whole range from 'A B C' up to preparing for high school, and each getting a fair share of a teacher's time, or anything like it, or the helpful companionship and encouragement that come from the presence of larger numbers of pupils at about the same stage of mental development, in the class. Then there is need of organization for efficiency—to have good teachers of experience. In many provinces, in most provinces, one-third only of the teachers in rural schools have taught more than three years, and one-third of all the teachers change their schools every term. Is that not a lamentable state of things in a country that calls itself enlightened like ours, that only one-third of the teachers have more than three years of experience and that one-third change schools every term? How can we have efficiency under such conditions? I would not leave a valuable herd of cattle under a herdsman and change him every six months. The herd would very soon come to grief if that were done. We pay so little heed to elementary education, we have made it of so little importance in rural districts, that only a man who is going to be a lawyer or a doctor or a dentist or a clergyman, becomes a teacher there for a brief period in order to get a little money to help him to enter his profession. This class forms a large proportion of the male teachers in rural schools; and for the rest we have young women teaching for two or three years only.

The aim, in even the least advanced of the localities in Canada, should be to have the schools open not less than 180 days every year; and in the well settled and developed rural districts, not less than 230 days in the year. Even that, which to some teachers might seem a long period, is only 230 out of 365 days in the year. Most of us work at least 280 days in the year. If the teachers and children cannot stand the strain, it is time to inquire whether much of the work is not of a wrong sort, or in a wrong direction, tiring the children by requiring a passive and receptive attitude for too much of the day, and wearing out the teacher by the wasteful repression.

ON PUBLIC OPINION.

I know that public opinion must give its sanction, its approval, to any public movement to make it thoroughly effective; and I know also that the factor in national life called "public opinion," itself requires to be educated. Every nation needs leaders, born into sympathy with its history and aspirations, and trained into ability to man-

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age its affairs in any new environment. The farmers should take an active part in this movement, and help to adjust the public schools to the requirements of their children. There is now an awakened interest in plans for their improvement, and some remedy for their unsatisfactory state is one of the pressing needs of the time.

The new education should meet the present-day needs of the people, who are amid new conditions in society and industry, brought about largely by increased control of forces of nature for utility and pleasure. The changes that have come and are coming, have made the outlook for the well educated farmer, his wife and children, still better, and have made the prospects and condition of the ignorant farmer deplorable.

Many sorts of service to the community are involved in honorable and intelligent citizenship. One of the most valuable, although not highly valued, of those is the service of the public school teachers. The fruits of their labours—education—leading to intelligence, personal ability and unselfish motive—should be made available to the lowliest in the land, according to their capacity. A properly organized system of education should ensure that the lowly and the poor also receive help, guidance, encouragement and leadership from those nobly endowed and rich in intellect.

The gifts of wealthy men, the wisdom of mature minds, and the energy and enthusiasm of young workers, are being organized into the movement for the improvement of education in elementary schools in Canada. The public will derive the benefit; the public will approve; the public will follow; the public will suport. Public opinion is being educated.

INSTANCES OF RESULTS FROM EDUCATION.

I need not give you instances of the results in material progress from education of the sort I have spoken of; I gave some of these before the Committee when I was here on a former occasion. Still I might repeat one or two instances briefly. In the matter of the production and exportation of butter, Canada was going far behind. In 1894 we sent out 32,000 packages from Montreal during the period of navigation. Then was begun a campaign of education and organization, to inform the people on the details of manufacture and on cold storage, the value of keeping butter cold, and of keeping the railway cars cold, and of keeping the chambers cold on the ships. It was a campaign of education, organization and illustration. It was so effective that last year the exports of butter from Montreal had risen to 539,000 packages.

I will also mention the work on Prince Edward Island by organizing and education in dairying which was commenced in 1892. In the year 1892, with the assistance of money given by the Dominion Government, I started one co-operative cheese factory at New Perth, in Prince Edward Island. The machinery was loaned by the Government. We sent an instructor to organize the business and to arrange the locality into routes for the convenience of those supplying milk. We ran the factory as a Government dairy station. In the autumn of 1892 I took the liberty of exporting to London $3,600 worth of cheese manufactured at that station, and I can recall the remonstrances of some of the people against risking their cheese in any steamer. I got fault-finding letters asking me why I did not sell the cheese at home or in Halifax. I had been in England, and knew something about the English market; and as I had insured the cheese for about 12 per cent more than it was worth, I felt easy on the subject. The cheese got to England, and was sold there for the top market price. Some of it indeed sold for sixpence per cwt. more. I angled for that sixpence and got it. Then, when the Island people knew that they had got sixpence per cwt. more for their cheese than was paid for any other Canadian cheese sold that day in London, it assured them that they could make fine cheese. That was the beginning of the export of cheese—to the value of $3,600.

At the taking of the census in 1891 there were four cheese factories in Prince Edward Island, with an output worth $8,448; when the census of 1901 was taken there were 47 cheese and butter factories, with an output valued at $566,824. There is the result of organization and education. There has been no increase in the number of

acres of land, and there has been but little increase in the number of cows kept. The change has been in the intelligent labour applied to the conditions. The people now run their own factories, and have repaid to the Government every dollar that was lent to them. I don't say that you could do this with dairying in all parts of Canada, but it can be done anywhere where the locality is adapted for it. There is no part of agriculture that is not susceptible to the same kind of improvement.

WHAT THE CENSUS SHOWED IN ONTARIO AND QUEBEC.

Take another instance on a larger scale. The province of Ontario is noted for the products of its cheese factories and creameries. It has made great advancement in quality and in quantity as between the two census periods 1891 and 1901. It increased the value of its output of butter and cheese from factories by over seven millions of dollars in ten years; that is to say, the value of the output in 1901 was $7,136,965 more than the value of the output in 1891. The province of Quebec had not advanced so far in co-operative dairying; but a beginning had been made in organizing its cheese factories and creameries into syndicates. The syndicate was a group of cheese factories or butter factories employing the services of a travelling instructor.

In 1892 I had the pleasure and honour of helping to start a dairy school for the province of Quebec. I was director of that school for some years, and the Department of Agriculture at Ottawa authorized me, as Commissioner, to turn in $3,000 a year of federal money to help the dairy school at St. Hyacinthe. Of course, I am not a constitutional lawyer. I was not supposed to know, and I confess I do not yet know, that the constitution of the Dominion reserves all questions and matters of industrial or technical education to the legislatures of the several provinces. I was not well informed with regard to that particular part of the constitution, and I confess I did not care very much. The constitution of a country, like the constitution of a man, may be for the weal of the country; and the weal of the country need never be subordinated for the sake of literal compliance with the phrases of its written constitution. 'The Sabbath was made for man and not man for the Sabbath.' So $3,000 a year of federal money went to the province of Quebec to promote dairying and agriculture by means of education. We did not call it education. That might have been an unconscious slap at the constitution. We began by giving short courses in dairying. Some of the wiseacres said it was foolish to think of imparting any education worthy of the name in a two weeks' course. However, we made it a rule that only students should be admitted who had worked for one year in a cheese factory or butter factory. We had neither the time nor the money to devote to those floating atoms who, in an indefinite way, wanted a college education for dairying. So no one could get the course at St. Hyacinthe unless he had previously had one year of practical experience. These were the very people we wanted to help. These were they who needed help. Then, the provincial authorities went further in organizing the factories in syndicates. No one was allowed to become a syndicate instructor unless he had taken the course, or courses, of instruction at the St. Hyacinthe Dairy School. During the first year (1892-1893) 214 students took the course. The next year 268 students took the course. The third year 328 students took the course; and so on.

Let us come back now for a moment to the census period, and see what the census says about the progress of co-operative dairying in the province of Quebec during that period. I have said that the province of Ontario did very well in the census period in the development of its cheese and butter business. The value of the output of the cheese and butter factories in Ontario in 1901, was $7,136,965 more than it was ten years before. I am referring now to the growth and not to the total output. In Quebec the output was $9,343,371 more than it was ten years before. The Quebec people were said to be backward, but they made this advance because of the instruction given in dairying—by means of education and organization. I could multiply such cases all over the Dominion.

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I could put my fingers on the places and the means—by means of organization and education as applied to farming in the provinces. I believe that similar means would be equally effective along the whole range of agriculture, from the cultivation of the soil to the finishing and shipping of the products. For that reason, and still more, to give the boys and girls the best chance possible to become the best they may be as men and women, I am heartily co-operating with Sir William Macdonald to promote better methods of education in the rural schools, the use of more suitable subject-matter for the training of young minds in the rural schools, and the development of a more wholesome spirit and loftier ideals of education in the common schools, that the boys and girls may get the benefit as well as the grown men and women. All this work is strictly educational. Every means employed has been used to stimulate, to induce, to lead the people to think and to do. Lots of men used to make fun of my speeches; I suppose they do so still more to-day.

The CHAIRMAN.—We are always very much pleased with them.

A. Sometimes they say: 'What is Robertson driving at? What does he mean by his humour; by his entertaining stories?' I never come to a meeting without having this thought in my mind, 'I will make these people think—think definitely with a purpose, towards expression by work and life—if I can.' That is a fine aim and use of education, to develop the ability to think clearly, then to know, and then to manage well by doing something. Trace out the development of cold storage by the work of our Department and it has been along these lines. These are the lines we hope to follow in this movement for the improvement of rural schools.

FARMERS' INSTITUTES, COLLEGES OF AGRICULTURE, NORMAL SCHOOLS AND RURAL SCHOOLS SHOULD WORK TOGETHER.

I want to have our rural school systems organized so that they will be correlated with the other existing institutions bearing on the education of rural communities. The organization of farmers' institutes for the grown people living in the country should be correlated to the rural schools for the young people living in the country. Then these two will have the same purpose, adapted, however, to the different conditions of the people, one class grown up, the other young.

Then the farmers' institutes should be in close connection with the colleges of agriculture. Every farmers' institute worker should have taken one or more of the short courses, not merely to be able to say something really good, but in order to say it in the most effective way. Suppose each province had a number of men trained for that, don't you think they could make addresses of a half hour each on the best methods of cultivation, and other subjects full of valuable information for their neighbours? In this way you would make available the teaching talent of the best practical farmers in each province. Let one man from the college staff go with two of the local men to each institute meeting and address the people. That is the means whereby the best knowledge of the best would become the common property of all in the locality.

Then, too, they should have close relations to the reports we publish from the Departments of Agriculture, so that if there be subject-matter in these reports, of value, they would be useful as a means of mental culture in the rural schools to a greater extent than some subjects entirely unconnected with their own life or country or conditions.

The rural schools should be correlated with a college of agriculture in every province, itself properly co-ordinated with the normal school, where teachers for rural schools receive their professional training and also a part of their scholastic course.

I am glad to know that as a partial result of this Macdonald movement, in the province of Nova Scotia, where I was lately a number of times, the provincial government has decided to build a college of agriculture; and to identify that college with the Provincial Normal School and with the rural schools. The legislature has voted

sufficient money to build a capital college of agriculture and to maintain it; and besides that, voted no less than $36,000 at the last session, to help to consolidate the rural schools, along the lines of the object lessons we are giving this year by means of the Macdonald Rural Schools Fund. In New Brunswick, I was invited to speak before the legislature at Fredericton only last week, and I was assured by the premier, and the members of the government, that they would do something in that province,—likely have an agricultural college identified with the normal school, and thus help to improve and enrich their already excellent rural schools—comparatively excellent rural schools—with the culture, with the contact, with the uplift of the university itself, which thus would find its helpful influences exercised in all the schools.

We must not consider the school question from the standpoint of expense at the schools alone. There can be no great advance in agriculture, which is a subject or interest in which Canada is most strongly, most vitally concerned, except by education, and no permanent improvement in education in the rural schools, except by consolidation of the rural schools. The two are inseparably linked together. Agriculture needs better schools, and better rural schools can be obtained by consolidation. There are obstacles and difficulties in sight, but the end to be gained is greater than any hindrances that loom up in the way. By means of the Macdonald Rural Schools Fund we have planned to give object lessons in the consolidation of rural schools and that to help to bring about in Canada what I have indicated in other words, viz., to make the country one more desirable to live in, and our people more prosperous, contented and happy, by progress in education—by progress in ability, in intelligence and in good-will and co-operation.

HOUSE OF COMMONS,
ROOM 34,

May 12, 1903.

The Select Standing Committee on Agriculture and Colonization met here this day, at 10 o'clock, a.m., Mr. Douglas, Chairman, presiding.

Professor JAMES W. ROBERTSON, recalled, addressed the Committee as follows:—

MR. CHAIRMAN AND GENTLEMEN,—I am to continue my statement this morning on what is being done by the Macdonald funds for the improvement of education, especially in rural schools. To make the information fairly complete, I hope that the members of the Committee will permit me, after a brief address, to put in some appendices and some additions to my evidence in written or printed form.

In nearly all other countries of late years a good deal of attention has been paid to the improvement of education on what is called practical lines; that is, on the line of training the childrens' bodies that they may be able to do things efficiently in the way of manual and industrial labour,—in training the children's bodies for the sake of training their minds through their bodies.

ROYAL COMMISSION ON THE SUBJECT.

In 1896 the Commissioners of National Education in Ireland requested the Lord Lieutenant to appoint a commission to inquire and report with a view to determining how far, and in what form, manual and practical instruction should be included in the educational system of the primary schools under the Board of National Educa-

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tion in Ireland. The following are extracts from the fourth and final report submitted on 25th June, 1898:—

'In carrying out the task imposed upon us by Your Excellency's Commission of January 25, 1897, we have had ninety-three meetings, of which fifty-seven were sittings for the receiving of evidence. We have taken the evidence of 186 persons whom we considered qualified to give information on the matters submitted to us, and we have visited 119 schools, in most of which we have had an opportunity of seeing manual and practical instruction actually given.'

'With a view to ascertaining the existing facts with regard to manual and practical instruction in Germany, France, Switzerland and Holland, we employed as our assistants to visit these countries, Messrs. Purser, Rolleston, Bonaparte Wyse, and Hughes-Dowling. The reports of these gentlemen will be found in Appendix B. We have had the advantage, too, of the assistance of Mr. M. E. Sadler, Director of Special Inquiries and Reports to the Committee of Council on Education, who was kind enough to furnish us with a memorandum on manual training for boys in primary schools in foreign countries. For our information regarding schools in the United States, we are indebted to the very complete and exhaustive reports issued by the United States Bureau of Education. We have also had the benefit of the experience of one of our colleagues, Professor Fitzgerald, who took the occasion of a visit to America, in the autumn of last year, to see some of the primary schools in that country.'

'RESULT OF INQUIRY.

'After careful consideration of the evidence laid before us, and of the facts which we have seen for ourselves, we now proceed to report, in accordance with your Excellency's Commission, how far, and in what form, manual and practical instruction should be included in the system of primary education carried out by the National Education Board in Ireland. We may at once express our strong conviction that manual and practical instruction ought to be introduced, as far as possible, into all schools where it does not at present exist, and that, in those schools where it does exist, it ought to be largely developed and extended. We are satisfied that such a change will not involve any detriment to the literary education of the pupils, while it will contribute largely to develop their faculties, to quicken their intelligence, and to fit them better for their work in life.'

'REASONS.

'The considerations by which we have been led to the general conclusions above set out, will be fully discussed in the second part of this report, under the several heads of manual and practical instruction. But we think it will be for your Excellency's convenience, that the general summary of our conclusions should be here followed by a general summary of the grounds on which they are based.'

'REASONS MAINLY EDUCATIONAL.

'1. First, then, there are reasons founded on educational principles. The present system, which consists largely in the study of books, is one-sided in its character; and it leaves some of the most useful faculties of the mind absolutely untrained. We think it important that children should be taught not merely to take in knowledge from books, but to observe with intelligence the material world around them; that they should be trained in habits of correct reasoning on the facts observed; and that they should even at school, acquire some skill in the use of hand and eye to execute the conceptions of the brain. Such a training we regard as valuable to all, but especially valuable to those

NOTE.—The Commissioners visited schools in Ireland, England, Scotland, Sweden and Denmark.

whose lives are to be mainly devoted to industrial arts and occupations. The great bulk of the pupils attending primary schools under the National Board will have to earn their bread by the work of their hands; it is therefore important that they should be trained, from the beginning, to use their hands with dexterity and intelligence.'

'REASONS FROM EXPERIENCE.

'2. Next, we have the practical experience of those schools in England, Scotland, and on the continent of Europe, in which such a system as we recommend has been already introduced and tested. The evidence we have received on this point is absolutely unanimous and, as we think, entirely conclusive. We have been told, over and over again, that the introduction of manual and practical training has contributed greatly to stimulate the intelligence of the pupils, to increase their interest in school work, and to make school life generally brighter and more pleasant. As a consequence the school attendance is improved; the children remain at school to a more advanced age; and much time is gained for the purpose of education.

'We inquired particularly whether the literary side of school studies—reading, writing, arithmetic, grammar, and geography had suffered any loss by the change; and the answer was uniform, that no such loss had been observed. In some cases, we were assured that the literary studies had been positively improved by the introduction of manual training. This result was accounted for, partly by the increased intelligence of the children, partly by the constant change and variety of their occupations,—many of the most useful exercises being only a kind of organized play, and partly by their increased interest in their work.

'We regard it also as a very significant testimony to the value of manual training, that wherever it has been once introduced, it has, with hardly an exception, been continued and extended. There has been practically no disposition to go back to the old system, which made primary education almost exclusively literary in its character; and after an experience extending over some years, there is a general consensus of managers of schools, inspectors and parents, that the value of primary education has been greatly enhanced by the change.'

'A BASIS NEEDED FOR TECHNICAL EDUCATION.

'3. Lastly, there is a consideration of a practical character, which seems to us deserving of no little weight. A strong desire exists throughout this country, and it is growing stronger every day, for the introduction of a general system of technical education. It is thought that a good system of technical education would contribute largely towards the development of arts and industries in Ireland; and in this opinion we entirely concur. But the present system of primary education is so one-sided in its character that it leaves the pupils quite unprepared for technical education. The clever boys trained in the national schools, if they are disposed to seek for a higher education, may pass with advantage into intermediate schools of the kind now general in Ireland; but they are not fit to enter a technical school, even if they had such a school at their doors. Now it seems to us the changes we recommend would go far to remedy this defect. The system of national education, modified as we propose, would give an all-round training to the faculties of the children, and would thus lay a solid foundation for any system of higher education—literary, scientific, or technical—which might afterwards be found suitable to their talents and their circumstances.'

'CONCLUSION.

'In presenting this report to Your Excellency, we venture to express our conviction that, if our recommendations be adopted, the system of education carried out in the primary schools of Ireland can be made, within a few years, very thorough and complete. At present, no doubt, it is excellent in some respects; but in other respects

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it seems to us seriously deficient. Insisting too much, as it does, on the study of books, it leaves the faculty of observation and other important faculties comparatively uncultivated; and it neglects almost entirely that training of the hand and eye which would be so useful to the children in their after life, and which is now regarded both in England and on the continent of Europe, as an element of great importance in primary education.

'The development of manual and practical instruction, on the lines we have pointed out, will remedy these defects, and will not, we are satisfied, inflict any injury on the literary education which is now given. It will not disturb what is good in the present system, but only supply what is wanting. It will quicken the intelligence of the children, brighten the tone of school life, and make school-work generally more interesting and attractive. With the system of national education modified as we propose, the children will be taught not by means of books only, but also by the more simple and effective agency of things; and they will be better prepared for their work in life, which, for the great bulk of them, must consist mainly of manual occupations.

'It is hardly necessary to say that the changes we have recommended cannot be carried out without a considerable expenditure of money. But we feel confident that the state, which so largely maintains and controls the system of national education in Ireland will not hesitate to provide the necessary funds for improving that system, within reasonable limits. The progress of the people in wealth and material prosperity must largely depend on the education given in the primary schools; and to make that education thoroughly efficient and fit for its purpose is a task, we submit, which may well be undertaken, in the highest interests of the state, whatever the necessary cost may be.'

I have quoted freely from that report. I am greatly indebted to it. I consider it peerless even among parliamentary blue-books for the thoroughness of its information.

At that time, 1898-99, in fact before that, Sir William C. Macdonald had been most anxious to help to improve rural schools in Canada; and he came to me for some help in the way of plan-making and administration. I said that in my judgment the first thing to do was to give object lessons of manual training in the elementary schools of cities and towns so as to educate public opinion in favour of better methods of education in places where newspapers were published and to which the country people looked for guidance. He rather demurred, saying the city and town schools were already too good in comparison with the country schools and tended to draw people in from the country to the towns in order to get education for their children. Afterwards when he saw it would be a means of helping the rural schools, he said, 'All right, we will carry on the manual training in some town schools.' The man in the rural district imitates the man who lives in town. The man who lives in town has the best chance of being a leader; and the man in the country would not be willing to take a lower grade of education for his boy than a town or city man. It was important to get the leaders from the cities to recognize improvement by means of practical education. That was the reason for the Macdonald Manual Training Fund and its work. Manual training was the first step in this plan. The rural school was not an afterthought; it did not come out of the manual training movement. The manual training movement was a step towards the other end—that of improving the rural schools. Hitherto the wealth and wisdom of the country have been given to town schools. The little rural school has been left without help.

We began in a rather modest way. I had no intention of making the scheme as large as the Macdonald Manual Training movement has since become. The first plan was to start one good centre in connection with the public elementary schools in Ottawa in order to give an object lesson here, as being the capital of the Dominion, where many influential public men come and would be able to see it. We hoped to start one at Brockville, Ont., also, and one at some place to be selected in the maritime provinces.

We need in Canada to have the public go to school; to have public opinion—that factor in our life which must sanction and approve of every public movement if it is to be effective—to have that factor educated that it may demand and provide better schools for the boys and girls of the rural districts.

You do not educate a boy by scolding him or denouncing him. You can help to educate him by praising him, by appreciating him; by giving him a chance to observe; to recognize; to investigate; to understand; to do—these are the means of education: opportunities for observation, for recognition, for investigation, for understanding, for doing. We are trying to educate the public by providing such means for them. We are hoping to give the public a chance to observe—to observe the better sort of school; to recognize its merits by investigation; to understand its use and bearings. That is the use of the Macdonald Manual Training Fund and the Macdonald Rural Schools Fund, and the meaning of the two handsome buildings which are to beautify the campus of the College of Agriculture at Guelph. The public are to have a chance to observe, investigate and understand, and then either go on with the new education, improving it, or give it up, as they decide for themselves.

After securing the assent of the Minister of Agriculture and conferring with the Departments of Education concerned, I met the local school boards and in substance said: 'If you want manual training, as you evidently all do, then the Macdonald Fund, which I control, is ready to provide the equipment, to pay the teachers and to maintain the centres for three years.' The school board in each case was quite willing to have that done, and arrangements were made to provide manual training equipments in a number of towns and to pay the teachers for three years. To obtain thoroughly trained and experienced teachers we had to go abroad for them, because at that time there was hardly any manual training in Canada. There was manual training at the Woodstock College, in Ontario, at the High School or the Normal School in Truro, N.S., at the schools in Halifax, N.S., and at the High School in Montreal. There was also manual training in the McGill Normal School in Montreal. But none of that was directly in the elementary schools. Therefore, I went abroad for teachers of ability and experience. Now all that has been changed, and Canadian teachers have been trained and properly qualified.

WHAT IS MANUAL TRAINING?

It is not what is known as physical culture in schools. That is another thing altogether, where children have gymnastics and physical training to develop their bodies. It is not like the education in trade schools advocated in the old countries a century ago and given up afterwards because they were not educationally a success. It is not technical education. I have been saying that for three years, even to ministers of education. Technical education is teaching a trade or profession, or the principles of a trade or profession. We do not teach trades in the elementary school. We train the boy for the sake of ability in the boy. Manual training is the training of the faculties. It is not industrial education; it is the general culture of the powers of the body and of the mind through the activities of the body, which is an essential part of education.

DIFFERENT FROM APPRENTICE WORK.

The system is sometimes called English Sloyd, or manual training. Sloyd is a Swedish word for 'dexterity.' Educational manual training is an entirely different thing from carpentry.

The manual training room is not a workshop where operations are carried on with a view to the commercial value of the articles turned out. A workshop is a money-making institution, whereas a room for manual training—for Sloyd work—in connection with a school, is for the training and developing of the children, without regard to the intrinsic value of the work turned out, or to the length of time required

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to make any particular object. Manual training is really a series of exercises so arranged as to have educational results.

How is manual training brought about? By working at a bench; making simple things in clay or cardboard or wood. It is a training in accuracy, in ability to control self and environment, in expression of thought, in deeds and in substances rather than in language.

A floor area of about six hundred square feet is enough to accommodate twenty pupils and one bench for each. A room 24 x 30 feet would be amply large; and would provide also for the instructor's bench and for a group of pupils to watch what he was doing. Ten classes of twenty pupils each, or two hundred in all, could be passed through such a room in the week. The benches are of convenient height and size, and each one is fitted with a rack for the holding of tools, and also with tools. Some of them are also fitted with a simple device for the holding of the drawings, so that the work with the tools may proceed with the drawing in full view all the time. General class instruction with the aid of a blackboard, is given by some teachers in a fifteen minutes' talk, before the particular work of the half-day begins ; and instruction is given also to each of the pupils individually as the work at the benches proceeds.

Children come from their ordinary subjects and studies, for one half-day every week and go to the manual training room and have one half-day's training there in making drawings and in making things in wood. They do that in the elementary schools in Canada for three years, and during the three years they make about thirty objects or models. That training gives the children ability in several ways of which I shall speak in a minute, which the book studies do not give them as fully. I take these two sample things—a wedge and a spoon—to illustrate this. A boy will get a piece of wood and will be shown a wedge like that (producing small wedge made in manual training class). Then he will get a lesson on how to make a drawing of the wedge, that way, and that way and that way (pointing to the three faces of the wedge). He is taught also how to measure, to measure the wedge or other model, to measure for his drawing and then to measure accurately on the wood as he makes his own model. He is taught what to do next, in sequence to make the wood take the shape of the wedge. To do this he must think clearly, because the order of his action depends upon his thought. If he does not think clearly, he will cut the wood in the wrong place and have to begin again at the beginning. That is very different from accepting the marking of an error in blue pencil. He is taught to think clearly towards an end believed by him to be useful. That is a great gain. I used to think and reason on the problems of Euclid, but never knew what end I was striving for. Manual training helps to carefulness, to accuracy, and to self-reliance. You can never juggle with facts or substances here. You cannot commit a sophistry in wood.

Mr. A. H. Leake, Director of Manual Training for the Province of Ontario under the Macdonald Fund, says :

'The first lesson necessarily consists of an explanation of the rule and its divisions, whether metric or English, practice in drawing lines of given length, first without the rule and afterwards with, and the drawing also of simple elementary figures to give dimensions. After this the boys are taught by an examination of the model itself and the instructions of the teacher to prepare a simple working drawing. Line by line the model is drawn upon the blackboard, the boys pointing out as the work proceeds the actual line of the model represented by the line on the board, so that when the drawing is finished the boys have a clear mental picture of the object they are required first to draw and then to make. No mere copying of drawings is allowed, and to prevent this and also to test the efficiency of the instruction, the drawing is erased and the dimensions of the various parts given, and from these and an examination of the model itself the boys are expected to produce a drawing, fully dimensioned, from which the model can be made. At other times they are allowed to measure the model for themselves and make their drawings from their own measurements.

'In addition to the models comprising the different courses, suitable object lessons are given on the growth, defects and character of the different timbers used and

the construction of the tools employed and in these lessons care is taken that the boy has an actual specimen of wood, or the actual tool in his hand, so that upon it he may exercise his own observation and judgment.

'At present the bench work is almost entirely in wood, and consists of a series of models most carefully graduated, in order of difficulty, as to kind of wood, principles of construction and complexity of tool operations. Every model is made from a fully dimensioned drawing previously prepared by the boy himself, first to full size, and later on to a scale. Accuracy of form and measurement is insisted on from the commencement, and it is surprising to find how soon a lad becomes dissatisfied with anything but the best he can produce. No work is accepted that a boy does not conscientiously believe at the time to be his best; and when a lad has made, say model 3, he often asks to be allowed to make model 2 over again, having discovered during the making of number 3, faults in number 2 of which he was not before aware.

'A record of the attendance and work of each boy is kept, so that any time the progress of any individual may be seen. Each boy is provided with an adjustable bench and a complete set of bench tools, placed in a rack at its back, while round the room are arranged the tools not so frequently required. In addition a separate pigeon hole or locker is given to each pupil in which to keep, from week to week, his apron, his drawings and his work, and for the neatness and tidiness of which he alone is responsible. At the close of every lesson each boy sweeps down his bench and replaces in its proper position every tool he has used. The rooms are also provided with museum cupboards, in which are exhibited the boys' best efforts, the standard models, and any interesting objects relating to the trees and timber of the province, that may be brought by the boys.'

An educational manual training course is always arranged with difficulties graduated to the ever-increasing capacity and ability of the pupils. When a boy has had experience in making simple things, he goes on to tasks which look more difficult but which in reality are just as easy to his acquired ability. He recognizes his own progress in ability—in power. That gives him confidence and a measure of self-reliance.

TO DO THINGS IN THE RIGHT WAY.

The boy learning to read or write does not get that advantage in as full measure: the consciousness of progress, by seeing the things done by himself. How many of us would know how to make that spoon, to tackle the task in such a way as to do the work well with the least waste of energy, material and time? That is the great qualification for any task one has in life. The boy is given a block of wood like that and is shown how to get a symmetrical, beautiful spoon out of it. The whole course is to train the boys into tackling difficulties in the right way, to do the right thing at the right time in the right way. He makes a drawing on the wood, then he begins to make it in the wood according to his drawing. He will saw that piece off, he will saw that piece off, he will saw this piece off, he will saw that piece off; and then he will begin, you see, to work down his spoon into its finished shape. The boy makes a drawing on paper, then he makes a drawing on wood, and follows the lines of the drawings on the wood with a saw. We all agree that this finished spoon is a beautiful object. It was made in one of our schools in Ottawa out of an oblong piece of wood like that I have just shown you. It illustrates the advantage which training into habits of carefulness confers. If the boy was not careful to make his first drawing right and then do his sawing in the right way, and in the right place, he could not end up with the fine curves of that spoon.

Q. The machines aid him, I suppose?

A. There is no machine; it is all hand work; there is no turning lathe in the place. It trains the boy in habits of accuracy; he is not merely guessing that it is about right; he has to get it exactly right, and that brings about that fine passion for accuracy, for truth, in the boy. The boy himself is the judge. That is a great gain. Instead of the boy always accepting the blue mark of his teacher's pencil in his ex-

ercise book, he brings his own judgment into play. It develops the habit of self-reliance. The teacher shows the boy how to do things, but nobody but the boy himself makes his model. If the teacher shows the boy how to use a saw, he does so on another piece of wood; the boy does all the actual cutting on his own material. That trains him to self-reliance, to depending on himself; that is a great gain.

TO SUPPLEMENT BOOKS, NOT TO SUPPLANT THEM.

Let me show you, if I may, for a moment how this supplements the ordinary book studies; it does not enable the teachers to do away with them. The book studies as a rule have rather magnified the value of knowledge: the knowledge of facts, of names and rules; that is what a book almost always does. That is not the case under this system.

The boy acquires a knowledge of things which are real to him; first by what is called sensuous knowledge, that is, knowledge he gets through his own senses; seeing, feeling, smelling, hearing and 'hefting.' When a boy is doing anything he is getting impressions through his senses. Secondly, he gains experimental knowledge by meeting obstacles and overcoming them. Moreover he adds to his logical knowledge; he reasons out that if he does a certain act or series of acts they will produce a certain result. This is far better than training the boy to a second-hand knowledge of facts which he gets from some other person's statements in a book.

May I for a moment show the characteristic differences between this and ordinary school work, and how this supplements that.

What are the differences most noticeable? The teachers in both are the prime factors; then what? What are the most noticeable things in the old schools? Books and examinations. Is not that so? What was most highly esteemed—most requisite in the ordinary examination? A knowledge of facts and names and rules and forms. Many a student says: 'If that does not help me in the examination, I have no time to waste on it.' But such a man will find his error bye-and-bye, when he is face to face with the obstacles of real life, which do not yield to anything but intelligence, ability and unselfishness. Books are good things, blessed things; the store house of the great thoughts, of the great achievements, of the great intellects among men. I would not whisper a disparaging word of books. But when you get a good book, a book to your liking, what is your attitude, whether you are young, middle-aged or old? An attitude of passive receptiveness. That is particularly the effect of the book on the mind of the young. Here are the bench, the tools, and the materials. They stand for the active and constructive. A boy who puts in part of his school time at these gets more good out of books in his passive and receptive periods. The bench is not in conflict with the book, but is the complement of the book; and both help the boy better than either would alone. Examination papers are the detestation of teachers, and they are not welcomed by the pupils. If a young man when he leaves school knows hardly any standard except the verdict of his superiors, he is ill fitted to meet life's difficulties for himself. It is good to accept the judgment of our superiors, and it is better to have the boy competent to pass his own verdict and say, 'That is the best I can do;' or, if it is not, 'I will go and do it better.' That is what the bench and tools and models demand and must have. They do not condemn the examination system, but make it effective. They help to turn out a strong boy willing to accept the decisions of his superiors, and knowing that he must pass verdict himself on himself and the quality of his work. Who cares if he cannot name all the varieties of spoons in wood that were ever made to represent the maker's thought of the beautiful, if he can make one spoon true to his model, to his idea? It is no education in the knowledge of oats to learn the names of the varieties of oats. It is an education to grow one variety under close observation and management. The bench and the tools make a boy have regard for a knowledge of relationships of things that are real to him; not merely ideas and abstract principles, but real to the boy of ten and twelve. He is trained by things

he knows are real. They are not any more real than others, but he knows they are. That is what counts in his education. These things make for character. The web and the woof of character are the ideas that are cherished, and the deeds done in the body.

As a matter of fact most boys who have been rather dull at their book studies have proven themselves to be exceedingly clever and able in these manual exercises, showing that many a boy is not ripe enough at 12 years of age, in fact few boys are, for the reception of abstract ideas, but is ready to make progress in understanding of the concrete. That has been found to be the case and has been especially commented upon by the principals in the city of Toronto; boys considered dull in other classes have in several schools become the star boys in manual training. They did not have minds mature enough to deal with truth in the abstract, but they had minds suited to deal with truth in the concrete. Training in that way helps to prepare the boy for the life that he will probably have to lead. It gives him a correct idea of the relationship of cause and effect.

EXTENT OF THE MACDONALD CENTRES.

The beginnings from which this movement sprang were small. As I have already said, the first intention was to establish one object lesson centre in Ottawa and two others. As the value of the work to the cause of progressive education became more evident, the plan was enlarged, and Sir William Macdonald made the increased provision in funds which that rendered necessary. Now we have 45 manual training teachers—experts in this branch of education—paid from the Macdonald Manual Training Fund. Agreements have been made with the school authorities at the following places; and in them manual training has been made part of the public school course. All of the agreements are not for three years. They all terminate at June, 1903, and a few of them were not entered upon until 1902.

In Ontario, Ottawa, Brockville and Toronto; in Quebec, Montreal, Westmount, Waterloo, Knowlton and Bedford; in New Brunswick, Fredericton; in Nova Scotia, Truro; in Prince Edward Island, Charlottetown, Summerside, Georgetown and Montague Bridge; in Manitoba, Winnipeg; in North-west Territories, Regina and Calgary; in British Columbia, Victoria and Vancouver.

In Toronto public schools there are only four centres accommodating 800 boys per week; in Montreal only one centre in addition to the double centre at the model school and McGill normal school; in all other places enough centres for all boys of suitable age in the public elementary schools. There are about 7,000 boys receiving the courses in the Macdonald Manual Training centres. In addition, the manual training is maintained by the Macdonald Fund at the provincial normal schools at Ottawa, Toronto and London in Ontario, and at Fredericton, Truro and Charlottetown in the maritime provinces.

Summer courses for teachers, already in the service of rural or urban schools, were provided. On Saturday forenoons, or at some other convenient time every week, classes were arranged for the teachers from whose schools the boys went to the manual training centres. In Ottawa these classes were attended by over 90 and in Montreal and Toronto each by over 100 teachers.

As I have said, there are 45 teachers paid from this fund, with a monthly salary list of over $3,600; and after June, 1903, the work will be taken over by the local and provincial authorities themselves. We will make a gift to the school board in each place of the whole equipment; and in every locality, with perhaps one exception, where the arrangement is not yet made, I think the school boards themselves will carry on this work and extend it.

In Prince Edward Island the provincial government has taken over the chief instructor and made him a provincial officer. The same thing has been done in Nova Scotia and New Brunswick; I hope it will be done in Quebec; and it has been done in Ontario. Winnipeg will carry on the work, as also will the educational authorities at Regina, Calgary, Vancouver and Victoria. The work that has been started under

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the Macdonald Fund will be carried on by the provincial and municipal authorities. In Nova Scotia manual training has been taken up in 14 other schools without assistance from the Macdonald Fund except that we have trained the teachers for them. It has been started in many other places in Ontario; and teachers have been trained for these also by the Macdonald Fund. This is an outline of the beginning of the movement; and as you see, it has had already very great growth.

By Mr. Ross (Ontario):

Q. How long is it since the movement was inaugurated?

A. Three years ago I gave an address in Ottawa, in November, 1899; that was the first public announcement of the plan. Perhaps it will please and serve the Committee if I put in an extract from that address, showing the progress of this movement in Sweden, Germany and some other parts.

OUTLINE OF THE HISTORY OF EDUCATIONAL SLOYD OR MANUAL TRAINING.

Only the barest reference can be made here to the history of Educational Sloyd. In fact I am not sufficiently acquainted with it to make more than mention of a few matters. Perhaps the movement has had its widest extension and best application in the elementary schools of Sweden. The following are quotations from 'The Theory of Educational Sloyd,' published by George Philip and Son, London:—

'The Sloyd movement in Sweden had begun in the late sixties and early seventies. It was first of economical rather than educational significance, *i.e.*, it was a movement for home industries, which, it was soon seen, must begin in the school if it was to have any lasting effect. Sloyd schools were started in different neighbourhoods by private individuals, some of them close at hand in the lan or county of Alfsborg, where Count Sparre, the chief of the county, had formed a Sloyd Union. Struck by the new movement, Herr Abrahamson, in February, 1872, opened a work-school for boys at Nääs, and two years later a similar one for girls, with his nephew, Mr. Salomon, for director.'

'In 1874, Herr Salomon became inspector of Sloyd schools for the middle district of Alfsborg lan, a post which he held for several years.'

'To meet the demand for Sloyd teachers, Messrs. Abrahamson and Salomon, in 1874, opened a training department in connection with their school, this being the first attempt of the kind.'

'The question now began to be looked upon from an educational rather than an economical point of view.'

'One thing was already quite clear. The teacher only could make Sloyd educationally useful, and so he strove henceforth to make the Sloyd School and the Folk School one. From 1878, therefore, he began to take ordinary teachers from his own lan in 5-or-6-week holiday courses in Sloyd, whilst still continuing the work of the Seminary on the same plan which he had begun four years before. But in 1882 came a thorough change. The twelve-month courses ceased, and the short courses were extended, first to all Sweden, and then to teachers from abroad.'

'At the same time, too, all other forms of Sloyd were dropped in favour of the one that was found the most useful educationally, viz, Wood Sloyd. The concentration of attention upon this one allowed of a development of it for educational purposes which it can scarcely be said to have received elsewhere. And there can be no doubt, too, that it is this concentration which has been a powerful help in securing the introduction of Sloyd into the 1,900 elementary schools in which it is now taught in Sweden.'

'Nääs is a good Sloyd school, and much besides. It is the meeting place of leading teachers of all degrees and all nationalities, for common work, and for the interchange of ideas. Professors, inspectors, secondary and elementary teachers, women as well as men, there meet on common ground as comrades. It fulfils more than any other institution that could easily be named, the ideal we are aiming at in England in

the Teacher's Guild. And this is due to the earnest co-operation, for the last 20 years, of three men, each of whom in his own sphere has done his very best. Herr Abrahamson has made a noble use of his wealth in founding the seminary, and providing for its continued existence; as a kindly host, too, he makes his interest and presence felt in all that concerns the common work and the common pleasure. His nephew provides the ideas and the direction; whilst Alfred Johansson is mainly responsible for the teaching in bench work, which occupies such a large part of the day. But the chief burden falls on director Salomon.'

Thus Sweden and in a measure all Europe are indebted to these two benefactors, Messrs. Abrahamson and Salomon, for the wise and unselfish use of wealth and personal ability.

*'The last thirty or forty years may be taken as the period within which the movement now in progress, for the introduction into primary schools of a system of manual exercises arranged with a view to their general educational advantages, had its beginning.'

'Within the present century, Finland was the first country to give a recognized place in the curriculum of the primary school to woodwork and other manual exercises. That it did so was in great measure due to the influence of Uno Cygnœus (1801-1888). His project for the reorganization of the primary schools of that country was carried into effect during the years 1858-1866. Cygnœus laid great stress on the general educational discipline given by manual exercises, as distinct from the economic advantage to be derived from the early acquisition of manual skill. In 1866, instruction in some branches of manual work, such as woodwork, basket work, tin work, or iron work, was made compulsory in the training colleges for male teachers, and in all primary schools for boys in country districts.'

'In Norway this branch of school-work was first recognized in the official programme in 1860. It is only within recent years that much attention has been given to the usefulness of a system of manual exercices as a branch of general primary education. Since 1891 it has been compulsory in all Norwegian training colleges and town schools.'

'In Germany, the false start originally made by the establishment of the schools of industry naturally put a serious obstacle in the way of the introduction of woodwork and other manual exercises as a part of primary education. But now throughout Germany there is in progress a movement for the purpose, thoroughly inspired by the educational idea, and this movement is steadily gaining ground.'

'Until very recently the movement in Germany had to depend exclusively on private effort. Its chief support came from an energetic association, the German Association for Manual Work for Boys. A great number of the best teachers of this branch of school-work in Germany have been trained in a training college established by this association at Leipzig, under the directorship of Dr. Goetze, who is one of the leaders of the movement throughout Germany. This college is open to foreign students, and has been largely attended by them.'

'The movement in Germany has at length won its way so far as to have its claim recognized for state-aid to the work it has undertaken to promote. The governments of Prussia, Saxony, and Baden now make state contributions in aid of this branch of school-work.' *

In England and Scotland gifts of money by private individuals and guilds enabled educational reformers to give the system a fair trial at many centres. During the decade now closing it has been taken up and extended by school boards, with the co-operation and financial support of the Department of Education.

In the United States it is making rapid headway. In most places where it has been introduced, the generosity of private individuals gave it a start; and it was then

* From memorandum on Manual Training for boys in Primary Schools in Foreign Countries, by M. E. Sadler, Esq., Director of Special Enquiries and Reports to the Committee of Council of Education, England.

taken up and made part of the public school system. I visited a school in Boston lately where I was informed this movement had its beginning in 1890. It is an endowed school, and the trustees (I am not sure of the correct designation) used part of the revenue to establish and maintain manual training. The report of the Committee on Manual Training intimates that the expenses of teachers at other schools in Boston for several years were paid by 'Mrs. Hemenway and Mrs. Shaw, whose names have become "household words" in Boston.' It is now part of the educational system under the school authorities; and this year I learned that there were 27 manual training centres in the public schools of the city. The foregoing are extracts from the address I delivered in 1899.

Q. Do you teach the boy the value of the material from which he is making his models; or, when it is a finished product; do you tell him suitable woods, valuable woods, and do you tell him the value of his time, and of the material used?

A. We do not take any notice of the value of the material or the time.

Q. You do not take up the commercial side?

A. No; we do not.

Q. You think the children are too young for the commercial side?

A. We think so. We do not think the elementary schools have to do with that. We teach the nature of the trees and the characters of the different sorts of wood; but the main purpose is to train the child in accuracy, carefulness and self-reliance, whether it takes him one day or many days to finish a task. When the boys have completed this course in Manual Training we hope to see them receive the beginnings of technical education in the high school grades. They will then consider the value of the materials. In the public elementary schools we do not train the children in regard to the value of materials, but in regard to the value of accuracy, carefulness, self-reliance and the character, developed by these means.

The following extract is from a statement by Archbishop Walsh of Ireland, on the subject of Manual Training :—

"These objects are of no commercial value, at least they are not valued for their own sakes. So far as intrinsic value goes they might be destroyed as soon as they are made. As has been well said in one of the best expositions of the system, they are, in this respect, like the pages of the copy-book that the child fills in when learning to write. It is not the objects themselves, but the making of them that is looked to. It is the work of making them that constitutes the means to the end that is aimed at—that end being the cultivation, not only of manual dexterity but of accuracy, of carefulness in little things, of neatness, of self-reliance, of patience, of perseverance, of concentration of thought upon the work to be done, of love for honest, well-finished work—in a word, the training and cultivation of all those faculties and habits which it is of the highest importance to cultivate as a preparation for the business of life."

By Mr. Wright :

Q. There is one important feature I would like to mention that we have found in our school. It has almost entirely eliminated truancy. Every boy is there every time. You cannot stop him from that.

A. That is one of the many things that are advantageous. For instance, the attendance at the manual training classes in Ottawa is much higher than the average in other school classes. The boys are never absent from this if they can help it; the interest of the work appeals to the boy himself.

By Mr. Erb :

Q. Is the instruction to the class collectively, or to each boy?

A. The teaching partakes of both. Sometimes class instruction is given; perhaps a plane is taken apart or a saw is examined and explained to them. This is class instruction; and then each boy gets instruction at his bench, on the particular work he

is doing. He need not keep pace with the others; he makes as rapid progress as he is capable of making. The class instruction is in regard to the tools and woods and from the blackboard in drawings. The rest is individual instruction at the benches. One great gain in this is that the boy does not waste time. If you go into a manual training room you will find all of the boys constantly at work. If the committee would care to come down to the large centre at the corner of Elgin and Maria streets to-day you would find a class there and I am sure you would be interested.

By Mr. Wilson :

Q. How large are the classes ?

A. Twenty to one teacher ; a double centre holds 40, and then there are two teachers in the room. The boys are so interested in the work that strangers may come in with one brief glance of observation. The boys go on with their work. The training of a boy in using his own time is an exceedingly beneficial feature. As I have already said, in the common country schools one of the great wastes is the waste of child-time, from one teacher being unable to keep all the children occupied. I think it is the most lamentable phase of our whole system, but in the manual training the child seldom if ever wastes time at the bench.

By Mr. Thomson (Grey):

Q. How does that differ from the instruction given in our reformatories ?

A. Manual training is in use in the best reformatories in the United States.

Q. Has it not been in use in Ontario for some years ?

A. I do not know.

Q. They employ something similar ?

A. They are engaged in making brushes and brooms and things of that kind.

In the United States reformatories they have had manual training on the Swedish system for several years ; and the incorrigible boys are put at it with excellent results. Reports say that the most incorrigible boys after three years' work have been so cured of their bad tempers by being taught to control their bodies, that they have been reformed by this more than anything that has been tried before.

We took for Canada the Swedish Sloyd modified by the Russian and English methods. Some of our original teachers had been trained in Sweden as well as in England.

Q. Why is it that Sweden is so far in advance of other countries in these matters?

A. I do not know except that as far as I know in every country that is ahead in education you can trace the advance to the action of one or two men. One or two men did something and the others fell in. That is why Sir William C. Macdonald has devoted a great deal of money to education, believing that when it is once started, of this more excellent sort, the regularly constituted educational authorities will carry it on. If it is good it will spread. What is always required is a man,—a number of men from time to time, ahead of their time ; and through them the nation goes ahead.

By Mr. Thomson (Grey) :

Q. Those who come here from Sweden are very superior in engineering, surveying or any other work of that class.

By Mr. Wright :

Q. I would like the professor to emphasize what he said about the incorrigible boys. The most incorrigible boy we had in the Renfrew school became our best boy in manual training.

A. That has been found in many of the schools. There is an abundance of manual energy in the able bodied boy which must find expression through doing things ; and if he is trained to do useful things in a systematic way, his energy finds a natural outlet and he becomes an able boy. It also satisfies the boy.

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The great progress that Denmark has made in dairying is very largely due to the excellent school system there. The butter maker we had at the Experimental Farm here in 1891 was a Dane and he had the benefit of this manual training in his school days. He made drawings and then worked them out in a way whereby he obtained a grasp of things. It was the mental and other training that he had that gave him the ability to take up a problem and work it out to a logical, practical, useful conclusion.

By Mr. Thomson (Grey) :

Q. There is no other reason for the excellence of the Danes than this technical or educational training ?

A. I do not think anything else counts for so much in their progress in recent years.

By Mr. Ross (Ont.) :

Q. It is the necessities of the country, I suppose, that make it desirable to have this manual training; or are they a superior class of people?

A. They are a good, sturdy, intelligent people, who have had far-seeing, capable leaders.

These teachers we brought out from Europe, mostly from England—we picked out the best men we could find—these teachers told me after being here two years, that they thought the Canadian boys in their classes showed more aptness, quickness and intelligence, than any children they had ever had before in their classes. That is the testimony of these teachers. Our schools have been too bookish; there has been too much of the passive and of the repressive in them, and too little of the active and the constructive.

How to apply these principles of education to our rural schools is a much more difficult problem than to apply them to a city school where they have graded classes.

Q. There are also graded schools in incorporated villages?

A. In towns, but not many in the country parts.

Q. There are also graded schools in incorporated villages?

A. There are a great many rural public schools in Canada that are not graded.

Q. Those are the purely rural schools that are ungraded, I guess ?

A. Yes.

The next part of the plan we have in contemplation is to give object lessons in important rural schools on similar lines to those followed in the object lessons in city schools. To make this clear to the Committee I think I cannot do better than put in part of an article I prepared recently on the improvement of rural schools by means of consolidation.

CONSOLIDATION OF SCHOOLS.

Some of the essentials for good rural schools are : (1) Good teachers with experience; (2) wholesome children; (3) efficient supervision; (4) good buildings; (5) neat and beautiful surroundings ; (6) active public interest and adequate support.

If we cannot arrange at once to bring into existence all the desirable conditions for good schools, we should strive to create as many of those conditions as we can in as many places as we can. There is no witchery or fairy charm in the word or fact of consolidation to put away all the present weakness and ills of small rural schools. However, consolidation will bring opportunities and means for improvement within reach of the teachers, the people and the children. Ever increasing benefits may be found by using those to the fullest extent.

GOOD TEACHERS.

Teaching is a great art. It is the art of living, the art of living and labouring so as to lead young lives out into desire and ability to live usefully, and, therefore,

happily. The greatest of all teachers said, 'I am come that ye might have life and have it more abundantly.'

In addition to scholarship the teacher should be an example of neatness, good manners, good temper and cheerful attitude towards life in general and towards the life of the schoolhouse in particular ; and should know by experience that observing, investigating, recognizing and understanding real things are forms of mental activity and power superior to the mere remembering of words, names, forms and rules.

New methods of education such as Nature Study, Manual Training and Domestic Economy would be made easily possible at consolidated rural schools. The teachers would find great satisfaction and delight in them. As it is the part of the public to provide means for the education of the children, it is more particularly the duty and privilege of the teachers to make the best use of those means. Here, as elsewhere, for the public at large and the teacher in particular, the paths of duty, happiness and progress are in the same direction and run within the same bounds.

Centralization of schools would provide for perhaps fewer teachers, but better teachers of more experience. At the present time there are comparatively few, if any, prize places in the teaching profession in rural schools. The coveted posts are in the towns and cities ; they draw the teachers of approved ability from the rural districts. Large central schools in the rural districts would provide what might be called, relatively, 'prize places' for teachers who would devote themselves to teaching as a life profession in rural districts. Teachers would stay in the same places far longer in consolidated schools than in one-room schools in the country parts.

WHOLESOME CHILDREN.

Various elements enter into the factors that make for a good education. Among these are a large enough attendance to form classes of children of about equal age and advancement in studies. The gathering of the children into a school where they could be properly graded, and, to a large extent, classified according to stage of advancement, would be a means towards that end. In that respect the town and city schools are in advance of the rural schools at the present time.

By centralization or consolidation, a large number of children could be brought together in one building. Strong classes could be formed, properly graded, and the children classified from time to time as advancement was made. Such classes stimulate every child to do his or her best. One child teaches another, on the whole, perhaps, quite as much as any grown teacher does. In other words, the stimulating, directing and informing power of a teacher is multipled two, three or even four times to many of the individual pupils through the passing on, by pupils to their classmates, of the help they have derived direct from the teacher. It is not only the clever and bright pupils who do this. Every child, in some measure, interprets to its fellow child some part or some phase of a lesson. By gathering the children from five or six rural schools into one central graded school, the teaching power of the children of the locality for other children in the locality would be utilized. Each pupil in a class learns much from his fellow pupils. As the bright, quick ones see, in part, others are helped to see ; as they reveal their methods of study, other children learn. Children also learn from classes to which they do not belong, as well as from children in the groups of their own degree of advancement.

EFFICIENT SUPERVISION.

Supervision of rural schools by school boards, inspectors and departments of education must be intelligent, sympathetic and skilful, co-operating with the teachers to bring the schools into touch with the homes and with the occupations of the people. Those who have the power of governing and responsibility of guiding must needs be in close touch with the lives of the people whose children are being educated, and in

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sympathy with the life which the children themselves will follow when they come to mature years. It is most promising and hopeful that the public school inspectors are leaders and guides in education, rather than official valuators of other teachers' work.

It becomes necessary that members of school boards should have a clearer appreciation of the qualities essential to a good teacher ; and of the fact that the best teacher becomes still better by at least two years of experience. School boards, for the sake of saving a few dollars in salary, cannot afford to have the children practised upon all the time by young teachers who are gaining experience at the cost of child-time and of the opportunities which to those particular children never come again.

The indifference, ignorance and selfishness of some parents come between their children and the chance of a good education. The united power and influence of departments of education, inspectors, school boards and teachers, must be exerted more energetically and patiently in behalf of those little ones.

GOOD BUILDINGS.

The rural schoolhouse is rarely a thing of beauty ; it is sometimes a place of discomforts and a hindrance to the natural development of robust bodies and to the growth of mental vigor and activity. Many a school still lacks suitable desks with comfortable seats. In matters of heating, lighting and ventilation, the lonely little school has been left untouched by the improvements which have made town schools models for promoting comfort and health. Everybody admits the high educational value of a well-constructed, well-arranged, well-equipped schoolroom, with windows and floors shiningly clean, and walls decorated with pictures. 'Day by day beautiful, comfortable and clean surroundings will have their ethical influence upon his development until he comes to abhor anything that is not beautiful, well ordered and clean.'

NEAT AND BEAUTIFUL SURROUNDINGS.

Pleasant and well-arranged surroundings are silent, potent educational forces. The child naturally tries to put himself into harmony with what surrounds him. That effort, often unconscious to himself, is part of his education. What a charge that sentence brings against the untidy, uncomfortable, unlovely interiors and exteriors of many schoolhouses in rural districts, and against their fenceless, uncared-for and hardly decent surroundings !

There are over 100,000 school gardens in use in European countries. These beautify the school grounds and are used for educational purposes as well.

Why should not the schoolhouse and school premises be the most beautiful and attractive place in the locality ? If the children are to spend between six and seven hours a day there, should it not be made a place to be proud of, and known to them as worthy of all praise ?

Would it not be a good thing if the bare, neglected, depressing and sometimes hardly decent surroundings of the schoolhouse were improved into gardens, expressing the refined taste and skill of the people of the locality, under the management of their teacher ? If unsightly and repellent premises are not in themselves degrading, they have a tendency to dull the taste and the judgment of young persons as to what should be esteemed. It is of great benefit in early life to have one's surroundings of such a sort as to inculcate and develop a love of flowers, of pictures, and of good books. The school should be a place for supplying those conditions in such a way as to help on the harmonious development of the child's character.

The rural school, as every other school, should be so conducted as to bring about the formation of desirable habits. Among those are regularity, punctuality, obedience, industry and self-control. Children who observed beautiful things, nicely arranged inside the school and outside the school, would also be more likely to observe graceful

speech, good manners and unflagging truthfulness, and to become respectful and reverent towards the beautiful and the good.

PUBLIC INTEREST AND SUPPORT.

It is not to be expected that simple consolidation of schools will create, at once, all the desirable conditions which have been referred to. If the centralizing plan enables communities and school authorities to do better for education than they can do at one-room schools, it is so far a helpful one. In 1902 I visited consolidated rural schools in Iowa and Ohio ; and after personal examination and inquiry, am convinced that many valuable advantages can be gained through the system of consolidation as it might be applied in Canada.

As far as could be learned at the places visited, there was almost entire unanimity of opinion among the ratepayers respecting the marked success and superior advantages of consolidation. While the scheme was brought into effect under vigorous discussion and considerable opposition, the adverse criticism has been disarmed by the results of experience. With few exceptions 'the kickers,' as they are designated locally, were ratepayers without children, or persons who feared some depreciation in the value of their own property, or, worse still, some increase in the value of the property nearest to the centralized school. Experience has proven the former of these two fears to be groundless.

A PIONEER IN CONSOLIDATION.

Six years ago Gustavus township, in Ohio, became the pioneer in that part of the United States in the consolidation of rural schools. There were nine school districts in the township, and as many small schools. Then the districts were united into one, and a central school was erected at a cost of $3,000. It is a frame building, containing four large, well-lighted class-rooms, a small recitation room and cloak rooms. Instead of nine teachers in little isolated schools, there are now a principal at a salary of $65 per month, and four assistant teachers at $32 or $30 per month, in the united school. Nine nice-looking vans are used to convey the children from and to their homes. These wagons, or school vans, have comfortable seats running lengthwise of the vehicle, waterproof canvas covers and spring gearings. Before consolidation the average attendance at the schools in that township was 125. On the day of my visit it was 143 out of an enrolment of 162. The year before consolidation the cost of maintenance of the nine schools of the township was $2,900. Four years afterwards the cost of the centralized schools, including the conveying of the children, was $3,156, being an increase in the expenditure by the township on its school system of $256. However, the average attendance at the central school was so much greater than at the single district schools, that the cost of education was decreased $1.59 per pupil on the average attendance. Moreover, three years of high school work is carried on in the consolidated school, and the total cost of that is included in the $3,156.

OTHER TOWNSHIPS.

The people in five adjoining townships have also consolidated their schools. Those of Gustavus, Kinsman and Johnston were selected for special scrutiny as presenting typical phases of the system. The schools of Kinsman and Johnston townships have been consolidated for two years. At Kinsman the enrolment of pupils was 146, and eight school vans were engaged ; at Gustavus 162 pupils were on the roll, and nine vans were used ; at Johnston 175 pupils attended school, and ten vans were in service.

Although the weather was rainy, and the roads as bad as three inches of snow mixed with mud could make them, the children jumped out of the vans at Kinsman school with dry clothing and dry feet. Little boys and girls of six years came three

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and four miles in comfort. The teachers said they came regularly in all weathers. Under the small district system in the township of Kinsman, two years before, the enrolment at the schools was 110 ; under the consolidated system it has risen to 146, without any appreciable difference in the total enumeration of children in the township. The high percentage of young children (6 to 8 years) and the large proportion of older pupils (from 15 to 20 years) were eloquent of the gains in education during the first two and the later years of school life in a rural district.

SCHOOL VANS.

The contracts for conveying the children to and from the schools are given to responsible persons. These are under bond to provide comfortable covered wagons and to comply with the regulations of the school authorities. The vans hold from 15 up to over 25 each. The longest route traversed was about six miles. The vans arrive at the school at from ten to twenty minutes before nine o'clock, the hour at which the forenoon session begins. The afternoon session closes at half-past three o'clock. At Johnston school where the closing exercises were observed, the children were in the vans starting for their homes in less than five minutes afterwards.

At Kinsman the eight vans are engaged at an average cost of $2.07 per school day; at Gustavus, the nine vans at an average of $1.25; and at Johnston, the ten vans at an average of $1.27. The price of the vans was from $100 to $135 each. All the vans observed were drawn by two horses each. The drivers who were conversed with said they had not known of any injury to any child. They said the regulations required them to wait for the children at any house for a period not exceeding two minutes; that as a matter of fact, it was rarely necessary to wait one minute, and that a case where the children missed the van or were left from being late was very uncommon. The average attendance at the schools confirmed all that.

THE SCHOOL WORK.

Mr. R. H. Cowley, Inspector of Schools for the county of Carleton, Ontario, accompanied me; and through the courtesy of the principals of the three schools we were enabled to obtain some information not hitherto recorded. That included, among other matters, the free expression of the opinions of the pupils themselves on the relative merits of the old and the new. Mr. Cowley summed up these points as follows :

'About five per cent of the pupils preferred walking to the old school rather than riding in a van to the new school. Almost without exception these were pupils who now have four to six miles of a drive in place of a former walk of one mile or less. At the same time these pupils expressed a decided preference for the work of the consolidated school. The evidence of both pupils and teachers goes to show that riding in the vans is alike comfortable and free from injury to even the youngest children. The increased enrolment of pupils and the very high percentage of regularity in attendance struck the visitors as remarkable. For the past three months the daily average attendance at the Kinsman school, which is in that respect typical, was 91 per cent of the number of pupils enrolled. More striking in this connection is the fact that the percentage of regular attendance among the youngest pupils—those of five, six and seven years—was as high as that of any other class.

'The three lowest grades overtake the work ordinarily covered by the public schools in Ontario. The highest grade goes as far as our continuation class, Grade A, being competent to accomplish about three years of high-school work.'

The large classes and larger schools seemed to meet the social needs of the children better than the small isolated schools. The older boys and girls, grown into young men and women, had opportunities for going on with a high-school education without going away from home. There was said to be, and there appeared to be, a great de-

velopment of a spirit of co-operation and of mutual good-will and friendship from the wider and closer acquaintance of the children of the locality, and from the new interests created and recognized as being common to all and for the common good.

SUMMARY OF ADVANTAGES

The carrying out of the plan for the consolidation of rural schools and the free transportation of pupils affords many advantages.

(1) It ensures the engagement and retention of some teachers of higher qualifications and longer experience in rural schools.

(2) It creates conditions for a proper classification of pupils and for such a grading of the schools as permits the pupils to be placed where they can work to the best advantage for their own improvement.

(3) It permits the time-table to be so arranged that teachers can give each class and every pupil in the class more direct help and supervision.

(4) It makes it practicable for rural schools to enrich their course for all pupils, by nature study, manual training and household science, as well as by better music; and for advanced pupils, by instruction in agriculture, horticulture and allied subjects.

(5) It provides the beneficial influences of fairly large classes of pupils of about equal advancement (a) by more companionship; (b) by friendly rivalries to excel; (c) by children learning from each other and (d) co-operating under careful discipline; and (e) by class enthusiasms.

(6) It results in the attendance of a larger number of the children in the locality, particularly of those under the age of eight years and of those over fifteen years.

(7) It brings about a more regular attendance of pupils of all grades of advancement; and encourages punctuality and promptness. The school van calls at a stated hour; instead of that being a cause of trouble in families it has been found a decided boon.

(8) It guards to a greater extent the health and welfare of the children. Transportation in covered vans protects them against wet feet, wet clothing and consequent sickness.

(9) It makes it convenient for boys and girls in rural districts to obtain a high school education without leaving home. That keeps boys and girls suited for life in rural localities in those localities.

(10) It leads to the erection of better school buildings and more satisfactory equipment in all the requisites of a good school.

(11) It stimulates the interest of the parents and the public in the schools, and brings to the people of a township an institution in which all can have an equal interest and a worthy pride.

(12) It establishes greater sympathy between the homes and the schools, enlarges the influence of the school, identifies it with the best efforts and aspirations of the people, and leads to the formation of reading circles and clubs for mutual improvement.

(13) It may lead to an improvement of the public roads in the country parts.

(14) It would facilitate the rural free delivery of the mail.

By Mr. Stephens:

Q. They do away with the little schools?

A. Altogether.

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By Mr. Ross (Ontario):

Q. Is it cheaper?

A. No, but it has cost less per average of daily attendance. The facts in regard to the township of Gustavus, Ohio, are that formerly they had nine little schools and these cost $2,900 a year. After consolidation they built a consolidated school and floated debentures to pay for it in ten years. The annual cost for maintenance was $3,156, or $256 a year more than that of the little schools.

Q. And there were 37 more pupils in attendance?

A. Yes.

By Mr. Robinson (Elgin):

Q. Does that include the cost of conveyance?

A. Yes.

By Mr. Thomson (Grey):

Q. And they will have a better class of teachers who will be better paid?

A. Yes.

Q. They say that the great difficulty now in small rural schools is that teachers are too young for the teaching of children.

A. There they have a good man at the head of each consolidated school, paying him $60 to $70 a month, and three women assistants, instead of nine teachers in the rural schools. The cost was from $1.25 to $2.07 a day on the average, for each van, for conveying the children.

By Mr. Ross (Ontario):

Q. Were these covered conveyances?

A. Yes. Some are being built in Ottawa to-day.

EXTENT OF CONSOLIDATION IN UNITED STATES.

The system of consolidation of rural schools has been introduced to a greater or less extent into seventeen states. The object appears to have been to secure a more regular and larger attendance of the children, and in some cases to reduce the cost of education. So far as reported upon, the cost under consolidation with the free conveyance of the children has been less than formerly (under the old system of one-room school sections) in 70 per cent of the cases considered, the same in 18 per cent, and more in 12 per cent. Wherever consolidation has been adopted, the people have not gone back to the old isolated section plan. The boys and girls in rural districts receive a high-school education without going from home. On one occasion I paid a visit to the great library of Congress at Washington. It cost a fabulous sum to build. It makes one think of the description of the New Jerusalem with its wealth of colour, its superb massiveness, its beauty and grandeur; but in my opinion the consolidated schools I saw in rural parts of Ohio and Iowa were a greater tribute and credit to the enlightenment and advancement and high civilization of the people of the United States than the splendor and magnificence of the home of books at the Capitol. Through the consolidated schools the children are being led into paths of intelligence, stability and usefulness. Nothing paves the way to those acquirements like making smooth the path of little feet to come dry to school, and to come willingly every day.

THE PLAN FOR CANADA.

We in Canada want something better than mere consolidation. We want not simply consolidation, but consolidation, where conditions are suitable for it, as a means towards an improved time table and a course of study and methods of study sufficient

for present day needs. This is what Sir William Macdonald is going to do—put object lessons of consolidated rural schools in each of the five provinces, Ontario, Quebec, Nova Scotia, New Brunswick and Prince Edward Island. He will build the schools outright, equipping them for manual training, nature study with school garden, and household science which is a course dealing with foods, clothing and house-keeping.

By Mr. Wright:

Q. Is there any kindergarten?

A. That is part of the education in the best schools now. These consolidated schools will be under the control of the school boards and provincial authorities as before consolidation. The schools will be equipped by the Macdonald Fund, but the school boards will manage them.

By Mr. Hughes (Victoria):

Q. You have made arrangements with the provincial authorities?

A. Yes, to carry it on in conjunction with them.

Further than that, the Macdonald Rural Schools Fund meets, for a period of three years, the additional expense of the consolidated schools over the cost of the small rural schools. There is a fund in my name, and I stand in as a new ratepayer; and for three years the school authorities assess me, as administrator of the Macdonald Fund, for what the consolidated school costs more than the little schools. The school sections and other authorities contribute exactly the former expenditure; and the Macdonald Fund meets the rest. The school remains under the management of the local authorities, and the extra cost is met by the Macdonald Fund for three years to enable the people of these five provinces to have this object lesson and experiment in education. Further particulars regarding that are contained in the letter and memorandum which I sent to the Premier of the province of Ontario on the subject. I shall add them as an appendix.

To begin and carry on that work it was necessary that it should not be conducted in an amateurish way. I conferred with the educational authorities in the provinces and got the names of one or two of their best teachers for the rural schools in each province. For New Brunswick I took the science master of the Normal School, a former country teacher; and another teacher who was eminently successful with a school garden of his own. I obtained suitable men from the other provinces. I made a class of these teachers from Canada, and sent them to the University of Chicago, where they had a nature study course under Professor Coulter and Professor Jackman. Then they were sent to Cornell University to get short lessons on horticulture, agriculture, and insect life, with special reference to rural schools. Then they were sent to New York, to Teachers' College in connection with Columbia University, to receive special training there on how to make themselves effective as school teachers in this newer education. These men are now back at the Ontario Agricultural College at Guelph, each working his own garden plot as each child will work at the school. The consolidated schools are to be built this summer and it is expected that they will be in operation next autumn.

Q. Have you ever made an estimate of the length of the route? You say it is six miles square in the school section?

A. That is so in the United States; in some cases in Canada the route will be five miles long.

Q. Have you ever figured out what the comparative cost would be supposing you had vans in each school section as it is at present, compared with the cost to the township board?

A. I think it would not cost much more than maintaining the schools now if the consolidated schools provided only the same sort of education; the extra cost will come in in providing training and study by the new and at first more expensive methods of manual training, nature study and household science.

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By Mr. McEwan:

Q. Did I understand you to say that the cost of conveying the children was $1.27 per day?

A. It cost $1.27 for the day, for each van, at Johnston, Ohio. There were eight or nine vans.

By Mr. Robinson (Elgin):

Q. Is there any arrangement for these vans to take the mails as they go along?

A. Not yet; but I have been discussing that with some of the public men.

We are also selecting a group of five rural schools in each of the five provinces already named. A travelling instructor will be placed in charge of the nature study at these schools, spending one day at one school and the next day at another. Each school will be provided with a school garden with a plot for each child of suitable age. We will maintain that also for three years, to see how far we can help the rural schools in that way, in localities where consolidation is not as practicable.

Sir William Macdonald further gave the sum of $175,000 to the Ontario government to provide buildings at Guelph to train teachers now in the service, for this new education. Two buildings are being erected there. Courses of instruction will be provided by the Ontario government without fees to teachers from all the five provinces for three years. The Departments of Education in Nova Scotia and in Ontario have already established courses in household science in the normal schools. No doubt that will be extended in all the provinces. When pupils who pass through these consolidated schools go on through the normal schools, each with advanced work and suitable professional courses in manual training, nature study and household science, they will be thoroughly qualified to carry on this better system of education without any special short courses at the Macdonald Institute at Guelph or elsewhere. The institute with its short courses is intended to meet the needs of teachers now in the service of rural schools, to give them a chance to qualify; and the normal schools of the various provinces will doubtless provide for the training of the teachers who attend them hereafter. After the three years expire, the Macdonald Institute, having served its first purpose, is to become an integral part of the Ontario Agricultural College, to give farmers' daughters as good an opportunity for advanced education suitable for rural life as has been hitherto available to farmers' sons.

By Mr. Ross (Ontario):

Q. Where is the first school to be situated, in Ontario?

A. The consolidated school is to be near the Agricultural College at Guelph, and the group of schools with the travelling instructor, in Carleton county.

Q. Are they open for inspection, or at this season?

A. Not yet; the men are merely grading and fencing the gardens. In Quebec the consolidated school will likely be at Ormstown and the group of schools in Brome county. In New Brunswick the consolidated school will be at Kingston and the group of schools near Woodstock. In Nova Scotia the consolidated school will be at Middleton and the group of schools near Truro. In Prince Edward Island the consolidated school will be at Hazelbrook, and the group of schools near Kensington. These specially trained teachers are under engagement to serve for three years to carry on this work.

It seems desirable also that the teachers in rural schools hereafter should be able to carry on advanced educational work at these rural schools by applying the lessons learned in the school gardens to agriculture and horticulture. The government of Nova Scotia is advancing in that direction; they have decided to build a college of agriculture at Truro and to co-ordinate its work with the normal school. The legislature of Nova Scotia also voted $36,000 at the last session, to promote and assist in the consolidation of schools.

By Mr. Wilson:

Q. We have not any in Ontario?

A. Not yet.

Q. When I was a boy, Dr. Ryerson took this matter up.

A. Quite so. This manual training idea has been entertained by leaders of education for many years, but there were no means to bring about its introduction generally until Sir William Macdonald came forward. What Sir William and I were able to do, was to give effect to the judgment of the best teachers by organizing it and applying it in a systematic manner. I hope this movement will make the educational uplift of an agricultural college in each province available to all the rural schools. In that respect the Ontario Agricultural College at Guelph has certainly come far short of doing all the good educationally it might have accomplished. It has not touched the rural schools at all. The agricultural colleges should train men and women who would become teachers in rural high school work, teachers in consolidated schools, and in evening continuation classes in rural schools. Very few farm boys ever can go to college. When the agricultural colleges are identified with the normal schools, they will have new and wider channels through which to pass on the benefits which their courses of study and training confer on their graduates. That is what is being organized now in the province of Nova Scotia; I hope it will be carried out also in New Brunswick and in the other provinces.

By Mr. Sproule:

Q. There must be a number of rural schools that are taught by girls, and how will they get the benefit of this education unless the whole province is organized into these groups?

A. I have been discussing this matter with the provincial Departments of Education, and I think I am within the mark when I say that in ten years after the Macdonald object lessons have been given, we will have over 1,000 consolidated rural schools in Canada, such as I have been describing this morning, with manual training, nature study in school gardens, and household science. I think that this movement will grow and spread faster than the cheese factory or the creamery movements grew. Even if we get only 400 or 500 consolidated rural schools in ten years, then the boys and girls who come from these schools, having received training in their school days, in manual training, in household science and nature study, as I have mentioned, will become the teachers in rural schools. In that way, even in districts where the small rural schools cannot be consolidated, the benefit of the training which has been given in those consolidated schools will be passed on by the agency of the teachers who have come from them. Thus it will become possible to get the advantages of the education and training of the agricultural colleges, through the consolidated rural schools, out to practically all the rural schools.

By Mr. Ross (Ontario):

Q. I notice that one of the magazines in the United States has taken up this question of consolidated schools, and said something about your work in connection with this matter, and has spoken of it very highly indeed.

A. Yes; an article has appeared in the *World's Work*. It is by George Iles, a Canadian now living in New York. He asked me for printed matter on the subject, which I was glad to supply. His article is receiving a great deal of attention in the United States. This is one of the great movements in the educational world; and I think Sir William C. Macdonald on that account deserves the greatest appreciation and credit for the way in which he is using his money. As I have said, since the committee is willing, I shall supplement these remarks by a few appendices.

By Mr. Sproule:

Q. I would like to say one thing with regard to the work that Prof. Robertson has been doing in connection with these schools. It had occurred to me that it is

outside the proper domain of this Committee's work. We have had in the past in this Committee a conflict between the rights of the provinces and the rights of the Dominion. The matters referred to us by the House of Commons are such things relating to agriculture and colonization as may be brought before this Committee; and we are instructed to inquire into these matters and report to the House with such suggestions as our wisdom and judgment should dictate. But in doing that we have had two or three times a little trouble about travelling outside our domain. I think Prof. Robertson is doing a good work; but I might remind him that he is employed as Commissioner of Agriculture and Dairying, and he may find people disposed to find fault with him and say that in the work that he has been speaking to us about this morning he is interfering with the work of the educational departments of the provinces. It is to avoid this that I make this suggestion, because I think if we do not attend to it earlier or later, we may have some trouble and conflict. It is the easiest matter in the world to raise a little jealousy and a little feeling over the action of the Dominion parliament in connection with the work and the rights and the duties, and the jurisdiction of the provincial parliaments to whom are always assigned the duty of education, and the organization as to what kind of education they shall have in the provinces. This is a matter we should bear in mind.

A. I think if Dr. Sproule had been here when I spoke at the last meeting of the Committee he would have seen that this aspect of the question has been fully considered. I do not undertake any of this work as Commissioner of Agriculture. I have the authority of the Minister of Agriculture to use my own time, as a citizen, in this work; and all the work I have done has been done entirely in accord with and through the provincial departments of education. My own preference was that Sir William Macdonald should put the work in the hands of a committee or a board of trustees. I thought that would have been an effective way. But Sir William Macdonald in substance said to me that if I would make the plans, administer the work and handle the money, he would provide sufficient funds to carry it through. He has done that so cheerfully that that side of the movement also has been to me a constant incentive and inspiration. The question was whether I would do it or not have it done at this time. I am doing it in my own time as a private citizen, and there is not a dollar of Dominion money going into the work.

By Mr. Wilson:

Q. You were asked to give this lecture by the Committee, I believe?

The CHAIRMAN.—Exactly so.

A. I have been guarded in the point raised, so as to avoid any conflict with the provincial authorities. I may tell the Committee that while I have worked hard for many years and enjoyed doing that in both capacities—as Commissioner of Agriculture and as a private citizen—if it came to abandoning this educational work or resigning my position as Commissioner of Agriculture, I would resign the Commissionership of Agriculture, because I am convinced that this educational work is of far more importance to the progress and welfare of the Dominion than my work as Commissioner of Agriculture.

By Mr. Robinson (Elgin):

Q. Dr. Sproule raised the question about seven-tenths of the teachers being females. Have you found any difficulty in that regard? Do you not find female teachers as good in this work as the male teachers in the United States?

By Mr. Sproule:

Q. I but thought when he stated that the agricultural college, that the work that is done there, was not as far-reaching in its ramifications as it might be if the school teachers in the rural schools were taught at the agricultural college, I merely sug-

gested that the bulk of the students at the normal schools were females, and that seven out of ten teachers were females, so that the pupils would not be able to get in the rural schools, where these female teachers taught, the benefit of the educational advantages at the agricultural colleges, as the female teachers do not attend there.

Mr. STEPHENS moved:

That this Committee now tender their thanks to Professor J. W. Robertson, Commissioner of Agriculture and Dairying, for the valuable and progressive character of the evidence furnished by him before the Committee in the current session of parliament.

The Committee notice with much pleasure the reported recognition by two of the leading Canadian universities of Professor Robertson's energetic administration in the public service of Canada, and the signal benefits that have resulted to her agricultural interests therefrom, by conferring upon him the educational degree of Doctor of Laws, and we hereby tender to Doctor Robertson our cordial congratulations upon his well-merited honours.

Mr. Ross (Ontario.)—I congratulate the country on having a gentleman in its service who is able to put before us so ably the matters which Prof. Robertson has detailed to us this morning.

Mr. Ross (Victoria.)—I have great pleasure in seconding the motion, and I may say there is no man in Canada who is so highly appreciated by the people of Nova Scotia as is Prof. Robertson.

The motion being put from the Chair, was unanimously adopted.

Having read over the preceding transcript of my evidence of May 1 and May 12, I find it correct.

JAS. W. ROBERTSON,
Commissioner of Agriculture and Dairying.

APPENDICES.

APPENDIX A.

BEING copy of a letter and memorandum sent to the Premier of the Province of Ontario *re* the Macdonald Institute at the Ontario Agricultural College at Guelph, Ontario.

OTTAWA, ONT., January 6, 1902.

The Honourable
G. W. Ross, Premier,
Toronto, Ontario.

SIR,—Sir William C. Macdonald, of Montreal, has authorized me to lay before you the following proposals. He desires to offer such assistance as he can towards enabling and encouraging public school boards and other educational authorities, (1) to improve the opportunities for education in schools in rural districts in Canada, and (2) to carry on the work at them in such a manner as will prepare and incline most of the boys and girls to live contentedly in the country and to follow occupations there with intelligent ability, happiness and success.

Taking cognizance of the reforms and advances in education in other countries, Sir William desires to hasten the introduction of such changes and additions as may be deemed desirable improvements in Canada.

For the purpose of this communication, these may be put into two divisions, viz.:—

(First), nature study and manual training as means of developing those faculties and forming those habits in children which the usual school studies, from books and theoretical subjects by themselves, leave almost wholly untrained and unformed,—for instance, observing carefully the common things around them, and investigating and tracing results back to their causes, all of which lead to a love of labour, a love of ideas and a love of nature; and

(Second), domestic economy or household science as a means of developing the intelligence of girls and young women and of training their minds and hands to those forms of ability which in after-life may be applied to home-making.

Consequently, I am authorized to say that if your government approves of the proposals presented in the accompanying memorandum and agrees on behalf of the province of Ontario:

First, to provide instructors at the Ontario Agricultural College for short courses in nature study for teachers from rural schools, without charging any fee for a period of three years;

Second, to provide a course or courses of instruction and training in domestic economy or household science of such sort and under such conditions and regulations as the government of the province may see fit to make; and

Third, to maintain, for those purposes, such buildings and equipment as are mentioned under parts 3 and 4 of the plan proposed,

Sir William C. Macdonald will donate a sum of $125,000* to provide, for the province of Ontario, buildings and equipment as are indicated in a general way in parts 3 and 4 of the plan proposed.

In addition, he will provide a fund to give effect to parts 1 and 2 of the plan for the improvement of education at rural schools as indicated, for a period of three years.

If you desire to suggest any modification or change which would make the plan proposed more effective for the purpose indicated, Sir William requests me to say that he will be grateful for such contributions to its improvement as your experience and interest in the subject enable you to make.

I have the honour to be, sir,
Your obedient servant,

(Sgd.) JAS. W. ROBERTSON.

*Afterwards increased to $175,000.

MEMORANDUM OF A PLAN PROPOSED FOR THE IMPROVEMENT OF EDUCATION AT RURAL SCHOOLS; AND FOR THE ESTABLISHMENT OF COURSES OF INSTRUCTION AND TRAINING IN DOMESTIC ECONOMY OR HOUSEHOLD SCIENCE AT THE ONTARIO AGRICULTURAL COLLEGE.

Having respect to the well known sayings, 'Seeing is believing' and, 'We learn by doing,' the plan which Sir William C. Macdonald offers as one desirable to carry out is presented in four parts,—three under the division of nature study, and the fourth under the division of domestic economy or household science.

PART I.—THE CONSOLIDATION OF RURAL SCHOOLS.

Part 1 of the plan is intended to give object lessons of improvements in education from the consolidation of five, six or more small rural schools into one central graded school, with a school garden and a manual training room as part of its equipment.

It is proposed to offer financial assistance to one locality in Ontario and one locality in each of the provinces of Quebec, New Brunswick, Nova Scotia and Prince Edward Island, to induce the people to undertake and carry on object lessons of improvements in education, with school gardens and manual training, all under the control of the regularly constituted educational authorities.

Notes on Part 1.

(*a*) In our educational progress not much has been done for the girls and boys in rural schools compared with what has been given to and made possible for the children in towns and cities. The difficulties which have hindered progress are said to have been: Want of money, the fact that the time table was already too full, and the fact that teachers are not properly qualified to take up better methods.

(*b*) In some districts the area for the rural school is so small that the lack of funds and the isolation of school authorities cause them to let educational matters

drift into weakness and inefficiency. If in some district an object lesson could be given of the consolidation of five, six or more weak rural schools into one well-appointed and well-sustained central school, that might lead to general improvement.

(*c*) In some of the United States the consolidation of rural schools has already been carried out to a considerable extent with very great gain in the quality of the education given in the locality, and in most cases with no increase of cost to the ratepayers.

It has not been difficult in Canada to arrange routes for the collecting of milk or cream to one central place; it would not be more difficult to arrange for the collection of children on various routes to one central school; and certainly the children of a neighbourhood are best worth the care, thought and spending of anything in the locality.

PART 2.—GROUPS OF RURAL SCHOOLS WITH A TRAVELLING INSTRUCTOR FOR EACH GROUP.

Part 2 of the plan is for the purpose of giving object lessons of the value of school gardens and nature studies at individual rural schools as a part of general education, to be begun by means of a travelling instructor, who would visit and spend one-half day per week with the children and teacher at each school of a group, for a term of three years, or until a considerable number of suitably trained and qualified teachers would be available to carry on such work themselves at rural schools.

It is proposed to offer financial assistance to one group of ten or fewer schools in one locality in Ontario, and to one group in each of the provinces of Quebec, New Brunswick, Nova Scotia and Prince Edward Island, to enable the people to provide school gardens, and to undertake and carry on object lessons and experiments with improvements in education, all under the control of the regularly-constituted educational authorities.

Notes on Part 2.

(*a*) A group of ten, or fewer, rural schools in some locality should be chosen in which to give an object lesson or illustration of this better education. If a competent travelling instructor were engaged to spend half a day of every week at each of these schools, he would be able to train teachers and children into methods of nature study. The travelling instructor would be a specialist in nature study and nature knowledge as well as a good teacher in the subjects which have been common in the schools in the past.

(*b*) It would certainly be of great benefit to the children at any rural school if a school garden containing plots for every child above the age of eight or nine years could be provided. Those plots would be used (like slates of large size) to put 'things' on, to be rubbed off when they had served their educational purpose. The gardens could be used, as they are at a few schools in England, and as they are at many schools on the continent of Europe, for the training of children to habits of close observation, of thoughtfulness, and of carefulness.

(*c*) If one may mention a method which would seem to include the best, it would be that of tracing results back to their causes, until that habit of mind is formed in the children. When a child does anything with its own hands, such as planting a seed, pulling up a plant, making examination of the changes which have taken place during its growth, making a drawing of it, mounting it and putting its name on it, he receives impressions by the sense of touch, he sees, he hears the noise of the movements he makes, and he smells the soil and the part of the plant with which he is dealing. Those impressions are definite and lasting; they add to the sum of sensuous knowledge; they prepare for the perception of logical knowledge, in a common-sense way.

(*d*) For instance, if a child should plant ten grains of wheat in a row, ten grains of Indian corn in another row, ten sets of potatoes in another row, and ten clover seeds in another row; if he should pull up one each of these plants every week, and find out

for himself, under the guidance of a competent teacher, what had taken place in the meantime; if, further, he should make drawings of the plants and a written statement of the progress of growth, as he was able to observe it, from week to week, such a course, occupying only half a day per week, would certainly give a boy or girl a great amount of exceedingly useful information, and also habits of investigation, observation, comparison and thoughtfulness, which are immensely desirable. These would quicken the intelligence of the children, and lead them to have both desire and capacity for living happily amid rural surroundings.

(*e*) Progress in agricultural education would be made by starting evening continuation classes in the rural districts in connection with those groups of schools, or in connection with the consolidated schools mentioned under Part 1. These would provide the true solution for education in agriculture and horticulture of youths in the country at the ages from fourteen to eighteen. One or two central schools of each of these groups might be chosen for evening continuation classes. At these, what the young lad, working on the farm, saw during the day with his uninstructed eye, could be explained to him in such a way as to awaken a new interest in his work, and greatly increase his ability for enjoying it and carrying it on well.

PART 3.—SPECIAL COURSES OF INSTRUCTION AND TRAINING FOR TEACHERS OF RURAL SCHOOLS.

Part 3 of the plan has for its object to assist in providing short courses of instruction and training for teachers for rural schools, who desire to qualify themselves in these newer subjects and methods of education.

It is proposed to offer to the province of Ontario at the Ontario Agricultural College at Guelph, a gift of a building, including a nature study plant-growing house, and such equipment as may be required, in addition to what is there at present, for the accommodation of teachers while taking short courses in nature study for rural schools.

Notes on Part 3.

(*a*) To make possible such additions and changes in rural schools as have been indicated, and to let them be capable of anything like general adoption and extension, there is need for further preparation of the teachers. No doubt teachers in Canada would be willing to qualify themselves for this better sort of work, if an opportunity were provided. It seems desirable and practicable to give such teachers the opportunity which they need.

(*b*) At several places in England in 1901, short courses of instruction and training in methods were provided for periods of only three weeks, with the expectation of doing a good deal towards qualifying teachers to carry on their work in a better way. In Canada, it might be possible to arrange for courses of training for thirty teachers at one place, each course to last for two or three months. During this course the teachers would carry on nature study work as they expected the children to do it at the school afterwards. A plant-growing house for nature study work would not be so costly for construction and maintenance that it would be a very difficult accommodation to have, for the winter and spring months when outdoor work would not be practicable.

(*c*) If provision should be made for a class of about thirty teachers at each short course, it is hoped that the government of each province concerned would arrange (by providing a substitute or otherwise) to enable approved teachers in rural schools to take the short course without loss of situation or loss of salary.

(*d*) For a period of three years, at least fifteen teachers of rural schools outside the province of Ontario are to be eligible to receive instruction and training in each short course without any fees.

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(*e*) For the first year, it is proposed to make, (1) an allowance at the rate of five cents per mile for the actual distance from the teacher's school to the Ontario Agricultural College, to help in meeting travelling expenses, and (2) an allowance of $25 to help in meeting the expenses of board and lodging, to every approved teacher who has taken a full course satisfactorily.

PART 4.—DOMESTIC ECONOMY OR HOUSEHOLD SCIENCE.

Part 4 of the plan is intended to assist in providing courses of instruction and training in domestic economy or household science for young women from country homes, in order that they may have opportunities for acquiring practical and advanced education not less suitable and helpful to them, than the present courses at the Ontario Agricultural College are beneficial to young men, who take them with earnestness and cheerfulness.

It is proposed to offer to the province of Ontario at the Ontario Agricultural College at Guelph, (1) a residence building to accommodate not less than 100 female students and teacher-students, daughters of farmers and others, and (2) class rooms, kitchen laboratories and other equipment necessary for courses of instruction and training in domestic economy or household science.

Notes on Part 4.

(*a*) Suitable courses (long and short) which would include instruction and training in dairying, poultry-keeping, bee-keeping, fruit-growing and general gardening, with particular attention to the cultivation of vegetables and flowers, would be highly valuable to the young women who were able to take them, and through their influence would be of far-reaching benefit to the rural schools, and the rural population generally.

(*b*) Special regard might be given to properly arranged lessons and exercises,—

(1) in the selection, preparation and serving of foods in the most nourishing, wholesome, appetising, and economical manner;

(2) in sewing, dressmaking and the simpler forms of household art and decoration; and

(3) in the care and cleansing of rooms, fabrics, sinks, &c.;

All to the end that the pupils might know the relation of those things to health and comfort, and might observe those methods and practices which make for good living in simple, clean, well-kept and beautiful homes in the country.

SUMMARY.

Such in outline is the plan which Sir William C. Macdonald offers to assist in putting into effect as mentioned in my letter of even date. Besides the benefits which have been alluded to, there would doubtless be others no less important to the pupils, the teachers and the schools. The knowledge gained by observation, experiment and experience would indicate what changes or modifications of the plan might be made with most advantage to the people in rural communities.

(Signed) JAS. W. ROBERTSON.

OTTAWA, Ont., 6th January, 1902.

APPENDIX B.

BEING copies of forms of agreements used with school boards under the Macdonald Rural Schools Fund.

Memorandum of provisional agreement between the school trustees, or commissioners, acting for the ratepayers of of the first part, and James W. Robertson, of Ottawa, in the province of Ontario, acting for the Macdonald Rural Schools Fund, of the second part.

Section I. Whereas it is desirable to offer some assistance to enable the people of and the neighbourhood to undertake and carry on an object lesson for improvements in education, through the consolidation of five or more rural schools into one central graded school, with a school garden and nature study, manual training and household science as parts of the school course, all under the control of the regularly constituted educational authorities:

Section II. Therefore, if the school trustees or commissioners, acting for the ratepayers of the school district or section, agree to unite with the school trustees or commissioners, acting for the ratepayers of at least four of the neighbouring school districts or sections, in the establishment and maintenance of a consolidated school, for a period of three years;

(1) By sending the children of school age to such school;

(2) By managing and maintaining the school through a board or committee, duly constituted to represent the people of the whole area, in a manner satisfactory to the Department of Education of the province; and

(3) By paying annually, during the three years, towards the cost of carrying on such consolidated school, a sum from each school district or section concerned, not less than the average amount expended annually for and in connection with maintaining the school in that district or section during the three years of 1899, 1900 and 1901;

Section III. Then, James W. Robertson, of the second part, acting for the Macdonald Rural Schools Fund, will agree:

(1) For the purpose aforesaid, to meet the cost of erecting an addition to some school building now in the locality, or to meet the cost of erecting at some point approved by him, a school building adequate to accommodate the children of the school district or section and at least four of the neighbouring school districts or sections;

(2) To meet the cost (a) of a school garden, (b) of preparing it for educational work for nature study, and (c) of providing equipment for the manual training and household science divisions; and

(3) To provide the school vans necessary for conveying children from the districts or sections outside of to the central graded school.

Section IV. In case the revenue from school districts or sections as already stated, and other sources such as municipal or provincial grants, are not sufficient to carry on the central graded school as outlined, then James W. Robertson, of the second part, will pay such a sum as may be agreed upon annually to meet the deficiency in revenue for a period of three years.

APPENDIX No. 2

Section V. In consideration of the financial assistance, mentioned in Section IV, the board, or committee, who manage the consolidated rural school, are to employ as the head master, and as the instructors in manual training and household science, teachers who are approved for those positions by the Department of Education, and are recommended by James W. Robertson, acting for the Macdonald Rural Schools Fund.

Section VI. It is understood that the provincial government and municipal authorities will pay annually to the board or committee not less than have been paid by them respectively during any one of the three years of 1899, 1900 and 1901, for the schools and teachers in the area served by the consolidated school; and will pay also to the board or committee any special grants which may be provided for any locality to encourage or assist (1) the consolidation of schools, (2) the conveyance of pupils, (3) the use of a school garden and nature study, (4) manual training, or (5) household science.

Section VII. It is expected (although this expectation is not to be held as constituting any part of this agreement), that the provincial government will pay one-half the cost of conveying the children to the central school from districts or sections in which the small schools are closed.

Agreed to on behalf of the ratepayers of the school district, or section

At.. in the
Province of..
this.. day of.. 190..

Agreed to on behalf of the Macdonald Rural Schools Fund.

At.. in the
Province of..
this.. day of.. 190..

Memorandum of provisional agreement between the school trustees, or commissioners, acting for the ratepayers of of the first part, and James W. Robertson, of Ottawa, in the province of Ontario, acting for the Macdonald Rural Schools Fund, of the second part.

Section I. Whereas it is desirable to offer some assistance to enable the people of to undertake and carry on an object lesson for improvements in education at rural schools, through the use of a school garden and nature study, all under the regularly constituted educational authorities;

Section II. Therefore, if the school trustees, or commissioners, of the school district or section agree to make nature study, through the use of a school garden and otherwise, part of the regular public school course;

Section III. Then James W. Robertson, of the second part, acting for the Macdonald Rural Schools Fund, will agree:

(1) To meet the cost (a) of a school garden, and (b) of preparing it for educational work in nature study;

(2) To pay the salary and expenses of a travelling instructor, to spend at least half a day per week with the children and teacher at such school, for one year, or

until a teacher suitably trained and qualified, is available to the trustees to carry on such work; and

(3) To meet the expense of maintaining the school garden for three years.

It is understood that the provincial government or municipal authorities will pay, towards the cost of such nature study and school garden work, the full share of any special grant or grants which may be provided by them for any locality for such purposes.

Agreed to on behalf of the ratepayers of the school district, or section

At.. in the
Province of..
this.. day of.. 190..

Agreed to on behalf of the Macdonald Rural Schools Fund.

At.. in the
Province of..
this.. day of.. 190..

APPENDIX No. 2

APPENDIX C.

BEING copy of a letter and memorandum sent to the Premier of the province of New Brunswick *re* a college of agriculture for the province of New Brunswick.

OTTAWA, March 14, 1903.

Hon. L. J. TWEEDIE,
Premier of New Brunswick,
Fredericton, N.B.

DEAR MR. TWEEDIE.—Herewith I enclose you a memorandum *re* the establishment of a college of agriculture in the province of New Brunswick.

You will observe that I have outlined the organization into six departments. The illustration stations and farm would not be a necessary part of a college of agriculture, especially during its first few years. A department of agriculture and live stock would include the dairying service which has been carried on in the province during a number of years. The departments of nature study and horticulture might be united under one head; and some of the more scientific parts of the work might be carried on by the science master at the normal school, or by one of the departments of the university. The departments of agricultural chemistry and physics and of English and mathematics could be carried on in connection with the work at the normal school, or in connection with the work at the university. To begin with, there would really be need for only two very competent men; but I would like to have an opportunity of discussing carefully what may be available at the university or at the normal school before giving a matured opinion on that matter. That would apply also to any estimate I might make for the costs of buildings required.

However, I am quite clear in my opinion regarding the desirability of having the college of agriculture closely identified with the normal school, and, as far as practicable, with the university. In many cases in the past, colleges of agriculture have been institutions carried on apart from the regular public school system of the provinces or states in which they were located. That has hindered their usefulness in very many respects.

If you desire it, I shall be glad to visit Fredericton some time after the legislature assembles, in order to confer with your government on this matter and to furnish any information to the legislature which I may be able to impart, on education for the improvement of agriculture in the province of New Brunswick.

Faithfully yours,

(Sgd.) JAS. W. ROBERTSON.

MEMORANDUM *re* THE ESTABLISHMENT OF A COLLEGE OF AGRICULTURE IN THE PROVINCE OF NEW BRUNSWICK.

The educational system of the province should be considered as a whole.

I. The course or courses of study should primarily be such as,—

(1) To develop good sturdy characters, and right habits in the pupils; and

(2) To qualify them to fulfil the duties of citizenship with intelligence.

II. Efforts to develop the elementary and secondary schools should be directed towards adjusting the subject-matter and methods of instructing the boys and girls, to prepare them for engaging successfully in occupations suited to their own locality or to some other part of the province.

(1) Nature study and school gardens; manual training in drawing, cardboard and wood; and domestic economy, are all in that direction.

(2) Some assistance for the extension of these has been and will be provided from the Macdonald Funds in the province.

III. Some work of a specialized character should be carried on in the high schools or academies and in the consolidated rural schools, preparing for technical education in agriculture and industries. After a time the work would become partly technical for the older and more advanced pupils.

IV. There is urgent need for one institution of college rank, where agriculture and horticulture would be taught effectively in short and long courses.

(1) The working farmers (in all the departments of soil, plant, and animal culture) require opportunities for short practical courses of instruction and training, adapted to them in their present circumstances and degree of intellectual advancement.

(2) The young men and women who are to teach the elements of agriculture, horticulture and industries and the sciences relating to them, to advanced classes in consolidated rural schools and academies, require a thorough training. A college of agriculture and industries, co-operating with the normal school, would furnish the best means in sight for giving such a training to teachers.

(3) A college of agriculture would be invaluable in improving the educational powers of successful farmers. They would become more efficient as instructors and leaders in farmers' institutes. The best knowledge of the best farmers would thus be made available to all the farmers in the province.

A college of agriculture would provide for co-ordinating and employing all the educational factors and forces of the province for the benefit of those engaged in its agriculture, horticulture and industries.

The following is the *order* (in time) in which it would appear desirable to have the matters to be dealt with taken up by the college:—

A. Short courses of instruction in special subjects, such as cultivation of soils, improvement of seed grains and crops, live stock, horticulture, dairying, poultry-keeping, bee-keeping, blacksmithing, carpentry, building construction, &c. These as already referred to under IV (1).

B. Courses in nature study and domestic economy and in the sciences relating to agriculture,—

(1) For teachers-in-training who intend to teach in rural schools; and

(2) For young men and women who intend to become instructors in the elements of agriculture and industries and the sciences relating to them, in the academies and consolidated rural schools; these as already referred to under IV (2) and under III.

C. (1) Co-operation with farmers' institutes; as already referred to under IV (3):

(2) Direction of illustration stations throughout the province upon lines somewhat similar to those which have been very useful under the experimental union of the Ontario Agricultural College:

(3) Supervision of research work.

D. A three or four year course for regular students intending to follow occupations connected with agriculture, horticulture or industries, and leading to the degree of Bachelor of Science in Agriculture.

APPENDIX No. 2

ORGANIZATION.

The work might be carried on in six departments:

(1) Agriculture and live stock.

(2) } Nature study.

(3) } Horticulture.

(4) Agricultural chemistry and physics.

(5) English and mathematics.

(6) Illustration stations and farm.

APPENDIX D.

BEING a suggestive course of nature study, by J. W. Hotson, M.A., Principal of the Macdonald Consolidated School, Guelph, Ont., and Geo. D. Fuller, B.A., Instructor in Nature Study, Macdonald Rural Schools, Knowlton, Que.

A SUGGESTIVE COURSE IN NATURE STUDY.

This course is intended to be merely suggestive. The aim throughout has been to indicate the character and scope of the work to be attempted in the different grades, rather than to specify the exact material to be used. In doing this we have tried to make it sufficiently definite and suggestive to be of use to the inexperienced teacher, yet not so detailed as to interfere with the individuality of a resourceful teacher.

This course may be modified to suit the requirements of any particular locality as the teacher may see fit.

The work prescribed for each grade is more than will probably be accomplished, so that the inexperienced teacher may select his work rather than be compelled to take definitely prescribed topics.

In ungraded or partially graded schools the work set forth may be combined as the teacher may see fit.

It is thought desirable that each class should be encouraged to grow something of merit for exhibition, either at the country fair or at the school.

The books referred to in the course of study and in the appended list are intended merely as guides for the teacher and in no case should they be regarded as text-books for the pupils.

ONTARIO AGRICULTURAL COLLEGE,
GUELPH, ONT., May 11, 1903.

GRADE I.

Autumn work.—Plant crocus bulbs for spring blooming.

General form of a few familiar trees, *e.g.*, maple, elm, spruce; and observations of the forms of the leaves of familiar trees.

General appearance and use of fruits; *e.g.*, apples, plums, grapes, beech-nuts, butter-nuts, &c.

Observe the forms and learn to distinguish a few of the commonest wild flowers, *e.g.*, aster, golden rod, &c.

Observe in a general way the habits of caterpillars in breeding cages, noting feeding and changes.

General study of landscape, representing it in water colours.

Winter work.—Study of pet and domestic animals, *e.g.*, cat, dog, mouse, cow, &c. Observe in a general way their form, color, size, shape of mouth, teeth, tongue, and habits of eating; ears and hearing; eyes and eye-sight; whiskers and feeling; feet and claws; their coverings and their young, and their calls and cries. The care necessary to keep them in comfort.

General study of landscape, representing it in water colours.

Spring work.—Plant and care for some early vegetables, such as pease or radishes. Observe the growth and flowering of crocus.

Observe the forms and learn to distinguish a few of the commonest wild flowers, *e.g.*, trillium, dandelion, &c.

APPENDIX No. 2

Use of plants and their parts to man:

(*a*) Useful roots, as carrots, beets, &c.
(*b*) Useful stems, as flax, trees, wheat (straw), &c.
(*c*) Useful leaves, as lettuce, cabbage, &c.
(*d*) Useful fruits, as strawberries, currants, &c.

Development of tent caterpillar from egg to pupa.

General study of landscape, representing it in water colours.

GRADE II.

Autumn work.—Plant tulips and observe seasonal changes in garden plants.

Dispersal of seeds and fruits. (Seed Dispersal, by W. J. Beal).

(*a*) Seeds and fruits carried by the wind, *e.g.*, dandelion, thistle and milkweed.
(*b*) Those carried by animals, *e.g.*, burdock, cocklebur, and sticktights (Bidens).
(*c*) Those carried by birds, *e.g.*, seeds of cherries, raspberries, &c.
(*d*) Those which float on water, *e.g.*, cress, grass and sedges.
(*e*) Explosive fruits, *e.g.*, violet, witch-hazel, and jewel-weed (Impatiens).
(*f*) Those carried by man, especially seeds of useful plants.

Habits of squirrels. Observe their food and habits of eating, the collecting and storing of nuts, their nests, their alarm calls, their walking, running and climbing, their taming and care as pets.

Observe hibernation of animals, *e.g.*, toad, frog, chipmunk, &c.

Make breeding cages and bring in caterpillars; observe their habits and changes.

Collect cocoons. (Comstock's Insect Life.)

The departure of birds, noting the direction they go and why. Singly or in flocks? Which leave first? Dates of departure.

General study of landscape, representing the seasonal changes in water colours.

Winter work.—Forms of water at various temperatures, including simple studies of condensation, evaporation, and crystallization.

Effect of heat on various substances, *e.g.*, sealing-wax, iron, &c.

Estimation of distances, weights and measures.

General study of landscape, representing the seasonal changes in water colours

The use of animals and their parts to man, observing the different uses made of the flesh, hides, fur, hair, bones, hoofs, horns, blood, fat, &c.

Spring work.—Plant and care for two easily-raised vegetables, *e.g.*, beans and squashes.

Growth and flowering of tulips.

Plant beans or pumpkins and study germination and growth.

Observe the life history of two or three insects, *e.g.*, grasshopper, cricket, mosquito, &c.

Note the emergence of moths from cocoons.

Study the feeding, nesting and habits of a familiar bird, such as the robin.

Observe the return of birds.

General study of landscape, representing the seasonal changes in water colours.

GRADE III.

Autumn work.—Plant narcissus and look after garden plot.

Coloration and falling of forest leaves. What trees and what parts of trees colour first? What part of the leaf is coloured first? What colour appears first (red or yellow)? Does colour appear before frost? Is frost the cause of colour?

General study of the autumn aspect of forest trees; deciduous habits, evergreens, &c.

Life history of the potato beetle.

Make a terrarium and observe the habits of such animals as toads, snakes, beetles, &c.

Recognition of ordinary soils, *e.g.*, clay, sand, gravel, loam, leaf-mould, &c.

Study the landscape and represent its changing appearance in water colours.

Winter work.—General study of the winter aspect of forest trees, including types of branching, character of bark, kinds of buds, &c.

Study the habits of the rabbit or hare.

Apparent motion of the sun and moon.

Recognition of the constellations of Orion, Ursa Major, Cassiopeia, &c.

Recognition of common rocks, as granite, limestone, sandstone, &c., noting their uses to man.

Study the landscape and represent its changing appearance in water colours.

Spring work.—Plant and care for garden vegetables, such as potatoes and sunflower.

Observe the development of narcissus.

General study of the spring aspect of forest and fruit trees, including bursting of buds, flowering, formation of fruit and leaf arrangement.

Habitat of common wild flowers. Flower calendar. (Nature Study and Life, p. 104, by C. F. Hodge.)

Life history of potato beetle.

Work and habits of earthworms. Observe their general external structure, movements, food and home, and notice the burrows and casts and infer their use to the worm and to man.

The observation of the habits of such animals as toads, salamanders, or snakes, in a terrarium.

Action of water on land, erosion and formation of land.

Study the landscape and represent its changing appearance in water colours.

GRADE IV.

Autumn work.—Plant hyacinths and look after garden plot.

Observe the preparation of plants for winter, *e.g.*, defoliation, winter buds, rosette arrangement of leaves, underground stems, &c.

Simple experiments in plant physiology. (See Atkinson's 'First Studies of Plant Life.')

Habits of wasps, mud daubers, social wasps, &c. (Comstock's 'Insect Life.')

Observe how insects breathe and eat.

Study the breathing pores of such insects as grasshopper, cricket, cabbageworm, &c., and compare the feeding habits of various caterpillars, beetles, &c.

Life histories of two or three injurious insects, *e.g.*, codlin moth, currant caterpillar, cabbage-worms, &c.

Make aquaria and study habits of water animals, such as fish, water beetles, &c,

Observe the effect on animals and insect life of a film of oil on the water.

Winter work.—Special study of forest trees. Observe the appearance and character of wood, the meaning of rings of growth, and medullary rays, the appearance and cause of knots. Compare the strength and elasticity of similar pieces of different woods, testing by weights. Study the more obvious abnormal features of trees attacked by fungous diseases, such as black knot, bracket fungi, witches' brooms, &c.

Simple experiments in plant physiology. (See Atkinson's 'First Studies of Plant Life.')

Observe the adaptation of parts of grass-eating animals to habits, *e.g.*, tongue and teeth of cow, horse, sheep, &c.

Observe the adaptation of parts of flesh-eating animals to habits, *e.g.*, teeth of cat and dog, feet and claws of cat, &c.

APPENDIX No. 2

Study habits of familiar winter birds, such as crow, chicadee, woodpecker, sparrow, snow-bird, blue-jay, &c.

Recognition of the planets and a few conspicuous stars, such as Polaris, Sirius and Veza.

The movements and phases of the moon.

Spring work.—Plant and care for garden vegetables, such as lettuce and Indian corn.

Observe the development and flowering of hyacinths.

Simple experiments to show the effects of light and water on plants. (See Atkinson's 'First Studies of Plant Life.')

Life histories of two or three injurious insects, *e.g.*, codlin moth, currant caterpillars, cabbage-worm, &c.

Note songs of a few common birds.

In aquaria, study the development of frogs or toads from the egg.

Study also the habits and food of other water animals, *e.g.*, fish, caddis flies, water-beetles, &c.

Flower calendar (continued).

Butterfly calendar.

GRADE V.

Autumn work.—Study the methods of propagation of woody plants by cuttings, using such plants as currant, gooseberry and grape.

Study plant colonies, such as free swimming plants, sphagnum bogs, swamp-forests, cat-tail and reed-grass societies. (See Coulter's 'Plant Relations.')

Study mosses and ferns, noting general characteristics, habits of growth, and methods of reproduction.

Study the habits and characteristics of bees and ants.

Special study of two or three familiar birds, as blackbird, bobolink, or cat-bird, noting home, movements, food, plumage, song, &c.

Winter work.—Physical analysis of soil. Find by experiment the amount of water, humus, clay, gravel, and sand present in different soils.

From these constituents make different soils, such as clay loam, loam, sandy loam, gravelly loam, &c.

Study a few minerals, *e.g.*, quartz, mica, felspar, and calcite, noting colour, form, hardness, &c.

Simple experiments in heat, including co-induction, radiation and absorption.

Gravitation, pendulum and clock.

Simple experiments with light, using prism, mirror and lenses.

Observation of the movements of stars, planets and constellations.

Spring work.—Plant and care for garden vegetables, such as cucumbers and tomatoes. (*Note.*—Flowering or ornamental plants may be substituted for vegetables in this or in the following grades, if thought desirable.)

Study the methods of propagation of herbaceous plants by cuttings, using such plants as petunia, geranium and begonia.

Ecological study of stems, leaves and roots. (See Coulter's 'Plant Relations.')

Mosses, ferns and horse-tails, noting the commoner species, general characteristics, habits of growth and methods of reproduction.

Study the habits and characteristics of bees and ants.

Special study of two or three familiar birds, as blackbird, bobolink, or cat-bird, noting home, movements, food, plumage, eggs, young, &c.

Butterfly calendar (continued).

Bird calendar.

GRADE VI.

Autumn work.—Learn to recognize the poisonous plants and trees of the locality.

A few of the more conspicuous fungi, noting particularly their manner of growth, colour, &c. Make cultures of moulds and other fungi.

Study the characteristics of two or three great plant groups, *e.g.*, crow-foot and rose families.

Identification of the weeds of the locality, noting their original habitat.

Study of spiders, noting external structure, food, webs, &c.

Special study of a few birds, as in Grade V., considering especially their beneficial and injurious relation to the farmer. ('Birds in Ontario in Relation to Agriculture,' by C. W. Nash.)

Observation and systematic record of the weather.

Winter work.—Simple experiments to show the difference between physical and chemical changes, and between mechanical mixtures and chemical compounds, *e.g.*:—

(*a*) Physical changes: water, ice, steam.

(*b*) Chemical changes: heat sugar and it becomes carbon.

(*c*) Mechanical mixture: sulphur and iron filings.

(*d*) Chemical compound: heat sulphur and iron filings and produce iron sulphide.

Use of thermometer, barometer and rain-guage.

Simple experiments in the use of levers.

Tie various knots and splice ropes, applying the knowledge to the making of halters.

Study of winter birds (continuation of autumn work.)

Spring work.—Plant and care for garden vegetables, such as melons and celery.

Learn to recognize the poisonous plants and trees of the locality.

Study the characteristics of two or three great plant groups, *e.g.*, lily and crow-foot families.

Give especial attention to experiments on larger garden plots. These plots may be used for experiments in :—

1. Rotation of crops, *e.g.*, 1st year, hoed crops, as roots and corn; 2nd year, grain; 3rd year, clover.

2. Methods of culture, *e.g.*, flat and hilled culture of potatoes; ensilage corn sowed broadcast and planted in drills and in hills various distances apart.

3. The effect of various fertilizers on different plants.

4. Results from selected seed.

Study of spiders, noting external structure, food, webs, &c.

Special study of a few birds as in Grade V, considering especially their beneficial and injurious relation to the farmer.

Bird calendar (continued.)

GRADE VII.

Autumn work.—Give especial attention to experiments on larger plots, as outlined in Grade VI.

Study characteristics of two or three great plant groups; a continuation of the work of Grade VI.

Study of weeds and the most efficient methods for their eradication.

Pruning grapes and small fruits and preparing them for winter.

Relation of insects to pollination of flowers (continued from Spring).

Study slugs and snails, noting external structure and habits.

Study clams or oysters, noting habits, food, &c. Observe shell, mantle, siphon, body, foot and gills. Study habits in aquaria.

APPENDIX No. 2

Nature calendar, a record of natural phenomena in chronological order.
The use of the rain-guage and the recording of the amount of rain-fall.

Winter work.—Experiments in plant physiology. (Macdougall's Nature and Work of Plants; Atkinson's First Studies of Plant Life.)

Analysis of plants to determine the amount of water, dry matter, carbon and ash in their composition.

The atmosphere and its composition, showing presence and amount of oxygen, nitrogen, carbon dioxide, organic matter, and other impurities. Simple experiments to show the union of oxygen and carbon in combustion.

A study of minerals and rocks.

Simple experiments in electricity and magnetism. (Brittain's Manual and Outlines for Nature Lessons; or High School Physics, Pt. II.)

The use of rain-guage and the recording of the amount of rain-fall.

Spring work.—Plant and care for two or three vegetables such as carrots and beets, using different varieties for comparison.

Give particular attention to the experiments on the larger plots, as outlined in Grade VI.

Study of weeds and the most efficient methods for their identification.

Practice in correct methods of pruning fruit trees. Top grafting, apples, pears, &c.

Study characteristics of two or three great plant groups—a continuation of the work in Grade VI.

A comparative special study of the germination of various seeds such as pine (*Gymnosperm*), Indian corn (*Monocolyledon*), ash, castor oil bean (*Ricinus*), maple and squash (*Dicotyledons*). (See Mrs. Wilson's Nature Study, p. 133.)

The relation of insects to the pollination of flowers. What insects visit flowers? How do they carry pollen? How does each kind of the insect reach the nectar? Which insects are robbers and which are true pollen carriers? The use of pollen by insects.

Observe the habits of humming-birds, particularly in relation to flowers.

Study of galls, noting their cause and general structure.

Nature calendar, a record of natural phenomena in chronological order.

The use of the rain-guage and the recording of the amount of rain-fall.

GRADE VIII.

Autumn work.—Give special attention to experiments on larger plots, as outlined in Grade VI.

Budding fruit trees, apples and pears.

The care of small fruits and their propagation by layering and stolons.

Collection of seeds, especially those of economic importance, including grain, seeds of weeds and seeds of forest trees.

Study of plant families represented in the garden, *e.g.*:

(*a*) Gourd family, including squash, pumpkin, cucumber, melons and gourds.
(*b*) Cabbage family, including cabbage, cauliflower, kale, Brussel sprouts Kohl rabi, &c.
(*c*) Grass family, including the various grasses and grains.

Injurious fungi and the use of fungicides.

Injurious insects and the use of insecticides. (See Weed's Insects and Insecticides, and bulletins available from Department of Agriculture, Ottawa, and Guelph Agricultural College.)

Nature calendar, a record of natural phenomena in chronological order.

Winter work.—Experiments in plant physiology.

Identification of weed seeds in grains by comparison with samples collected in the autumn.

Simple experiments on frictional electricity and magnetism.

Simple experiments in chemistry.

Distinguishing characteristics of the great groups of vertebrates, viz., mammals, birds, reptiles, amphibians and fishes.

Spring work.—Plant and care for some of the rarer garden vegetables, *e.g.*, salsify, egg-plant and pepper.

Give especial attention to experiments on larger plots, as outlined in Grade VI.

The care of small fruits and their propagation by layering, stolons, &c.

Study plant families represented in the garden, *e.g.* :—

(*a*) Gourd family, including squash, pumpkin, cucumber, melons and gourds.
(*b*) Cabbage family, including cabbage, cauliflower, Kale, Brussels sprouts, Kohl rabi, &c.
(*c*) Grass family, including the various grasses and grains.

Injurious fungi and the use of fungicides.

Injurious insects and the use of insecticides.

Root-grafting of apples, pears, cherries, &c.

Nature calendar, a record of natural phenomena in chronological order.

BOOKS FOR REFERENCE.

Nature-study.

Nature-study and Life; C. F. Hodge
Ginn & Co., New York. $1 50
Nature-study in Elementary Schools; Mrs. Wilson
G. N. Morang & Co., Toronto. 0 90
Handbook of Nature-study; Lange
G. N. Morang & Co., Toronto. 1 00
Nature-study and the Child; C. B. Scott
D. C. Heath & Co., Boston. 1 50
Nature-study for Common Schools; W. S. Jackman
Henry Holt & Co., New York. 1 20
Guide to Nature-study ; M. R. Crawford
The Copp Clarke Co., Toronto. 0 90
The Nature-study Idea; L. H. Bailey
Doubleday, Page & Co., New York. 1 00

Plant Life.

Trees of the Northern United States; A. C. Apgar
American Book Co., New York. 1 00
Familiar Trees and their Leaves; S. Mathews
D. Appleton & Co., New York. 1 75
Corn Plants; F. L. Sargent
Houghton, Mifflin & Co., Boston. 0 60
First Studies in Plant Life; Geo. F. Atkinson
Ginn & Co., Boston. 0 60
How to Know the Wild Flowers; Mrs. Wm. Starr Dana
Scribners, New York. 2 00
Nature's Garden; Neltje Blanchan
Doubleday, Page & Co., New York 3 00

APPENDIX No. 2

Mushrooms; Geo. F. Atkinson
Andrus & Church, Ithaca, New York 3 00
Plant Relations; J. M. Coulter
G. N. Morang & Co., Toronto 1 10
Plant Structures; J. M. Coulter
G. N. Morang & Co., Toronto 1 20
Ferns and their Haunts; Clute
Seed Dispersal; W. J. Beal
Ginn & Co 0 40
Ten New England Blossoms; C. M. Weed
Houghton, Mifflin & Co 1 25
The Weeds of Ontario; F. C. Harrison
Dept. of Agriculture, Toronto free.
The Nature and Work of Plants; D. T. Macdougal
G. N. Morang & Co., Toronto 0 80
Fungi and Fungicides; C. M. Weed
Orange, Judd & Co., New York

Animals.

Animal Life; Jordan and Kellogg
D. Appleton & Co., New York 1 25
Squirrels and other Fur Bearers; John Burroughs
Houghton, Mifflin & Co., New York 1 00
Manual of the Vertebrates; D. S. Jordan
A. C. McClueg & Co 2 50

Birds.

Bird Life (coloured plates) ; F. M. Chapman
Appleton & Co., New York 5 00
Bird Neighbours; Neltje Blanchan
Doubleday, Page & Co., New York 2 00
Birds of Village and Field; Florence Merriam
Houghton, Mifflin & Co., New York 2 00
Our Native Birds; D. Lange
G. N. Morang & Co., Toronto 1 00
Birds of Ontario; Thos. McIlwraith
Wm. Briggs, Toronto 2 00
Handbook of the Birds of Eastern North America ; F. M
Chapman; Appleton & Co., New York 3 00
The Birds of Ontario in Relation to Agriculture; C. W. Nash
Dept. of Agriculture, Toronto free.

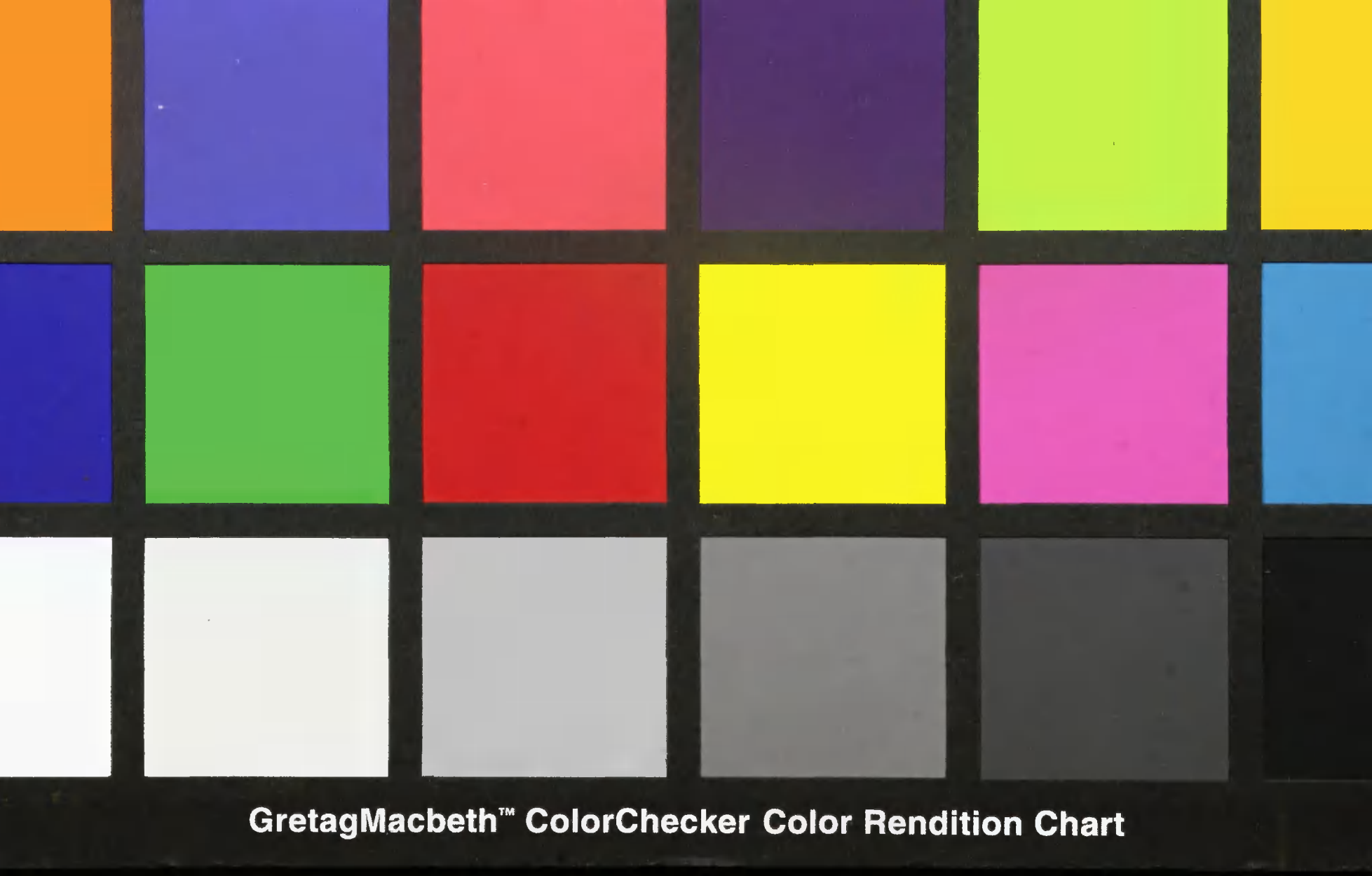
Insects.

Insect Life; J. H. Comstock
G. N. Morang & Co., Toronto 1 25
The Insect Book; L. O. Howard
Doubleday, Page & Co., New York 3 00
Manual for the Study of Insects; J. H. Comstock
Comstock Publishing Co., Ithaca, N.Y 3 75
Bee People; M. W. Morley
A. C. McClueg & Co 1 25

The Butterfly Book; W. J. Holland
Doubleday, Page & Co., New York. 3 00
Every Day Butterflies; S. H. Scudder
Houghton, Mifflin & Co., New York. 2 00
Insects and Insecticides; C. M. Weed

Physics, Chemistry, &c.

High School Physics (of Ontario), Parts I. and II
High School Chemistry (of Ontario).
Easy Experiments in Physics; P. Smith
Morse Co. 0 60
Simple Experiments for the School-room ; J. F. Woodhull
E. L. Kellogg & Co., New York. 0 50
Home-made Apparatus; J. F. Woodhull
E. L. Kellogg & Co., New York. 0 50
Inductive Elementary Physical Science; F. H. Bailey
D. C. Heath & Co., Boston. 0 50
Manual and Outlines of Nature Lessons; J. Brittain
J. & A. McMillan, St. John, N.B.


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